

One Dollar

ANNUAL STATISTICAL AND OUTLOOK NUMBER

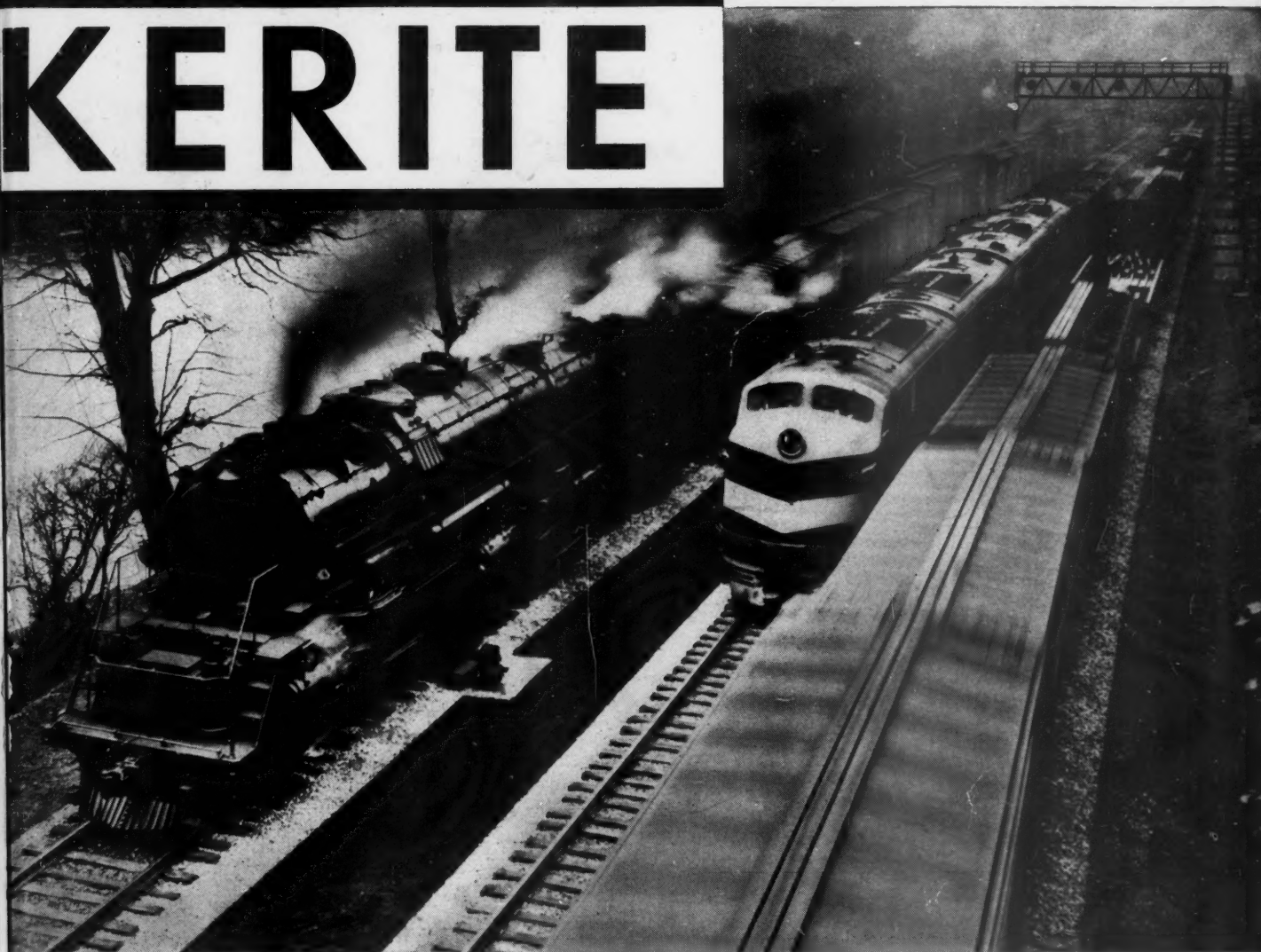
Editorial Contents, page 12

JANUARY 4, 1947

JAN 13 1947

Railway Age

KERITE

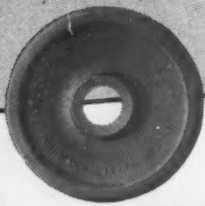


***Dependable Signal Service
For Increased Track Capacity***

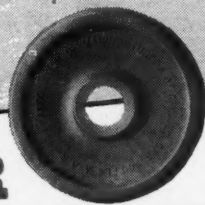
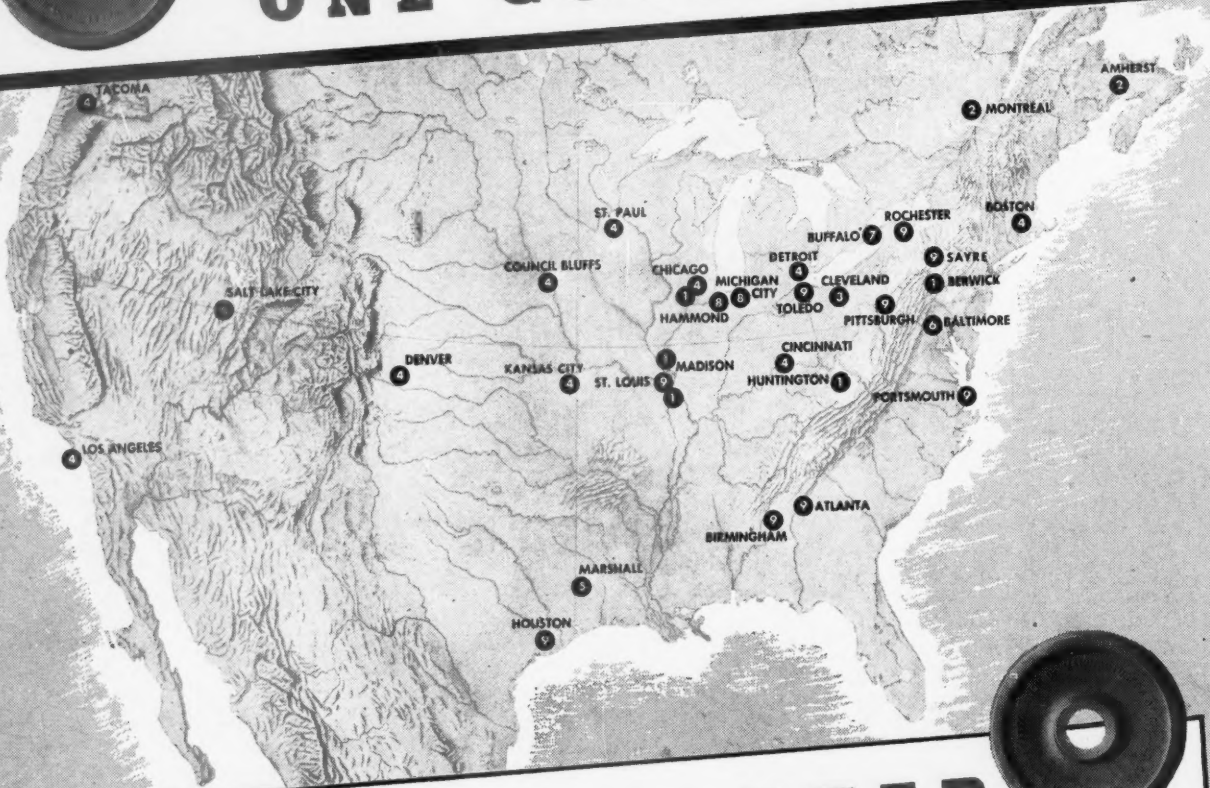
THE KERITE COMPANY

NEW YORK • CHICAGO • SAN FRANCISCO • LOS ANGELES

PIONEERS IN CABLE ENGINEERING



ONE GOOD WHEEL



ASSURES ANOTHER

- ① American Car & Foundry Co.
- ② Canadian Car & Foundry Co.
- ③ Cleveland Production Co.
- ④ Griffin Wheel Company
- ⑤ Marshall Car Wheel & Foundry Co.
- ⑥ Maryland Car Wheel Co.
- ⑦ New York Car Wheel Co.
- ⑧ Pullman-Standard Car Mfg. Co.
- ⑨ Southern Wheel (American Brake Shoe Company)

Each spot on this map is a source of chilled car wheels you can count on. *Yet each is more than that.* Each is a reliable place for you to *market* your wheel scrap . . . to assure needed production for your future requirements by reserving your old wheels for the AMCCW wheel company which serves you.

Every plant marked is operated by an AMCCW member in good standing — with all that such membership always indicates as to quality controls rigidly maintained.



ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS

445 NORTH SACRAMENTO BOULEVARD, CHICAGO 12, ILL.

Organized to achieve: Uniform specifications — Uniform inspection — Uniform product

W.M.

Transp. Lib
direct

Railway Age

With which are incorporated the Railway Review, the Railway Gazette,
and the Railway Age-Gazette. Name registered in U. S. Patent Office.

Vol. 122

January 4, 1947

No. 1

Annual Statistical Number

PUBLISHED EACH SATURDAY
BY THE SIMMONS-BOARDMAN
PUBLISHING CORPORATION, 1309
NOBLE STREET, PHILADELPHIA
23, PA., WITH EDITORIAL AND
EXECUTIVE OFFICES AT 30
CHURCH STREET, NEW YORK 7,
N. Y., AND 105 W. ADAMS STREET,
CHICAGO 3, ILL.

WASHINGTON 4, D. C.: 1681 NA-
TIONAL PRESS BUILDING—
CLEVELAND 13: TERMINAL
TOWER—SEATTLE 1: 1033 HENRY
BUILDING—SAN FRANCISCO 4:
800 MONTGOMERY STREET,
ROOMS 805-806—LOS ANGELES 14:
530 WEST 6th STREET—DALLAS
4: 2906 MAPLE AVENUE

SAMUEL O. DUNN, CHAIRMAN.
JAMES G. LYNE, VICE-PRESI-
DENT—ASSISTANT TO CHAIR-
MAN. HENRY LEE, PRESIDENT.
ROY V. WRIGHT, VICE-PRESI-
DENT AND SECRETARY. C. MILES
BURPÉE, F. E. THOMPSON, F. C.
KOCH, R. E. THAYER, H. E. Mc-
CANDLESS, S. WAYNE HICKEY,
VICE-PRESIDENTS. J. T. DeMOTT,
TREASURER. RALPH E. WES-
TERMAN, ARTHUR J. McGINNIS,
ASSISTANT TREASURERS.

SAMUEL O. DUNN, EDITOR.
JAMES G. LYNE, ASST. TO EDI-
TOR. ROY V. WRIGHT, MANAG-
ING EDITOR. NEAL D. HOWARD,
WESTERN EDITOR. C. B. PECK,
ALFRED G. OEHLER, E. L. WOOD-
WARD, J. H. DUNN, H. C. WIL-
COX, CHARLES LAYNG, GEORGE
E. BOYD, WALTER J. TAFT, M. H.
DICK, W. H. SCHMIDT, JR., C. L.
COMBES, C. B. TAVENNER,
CHARLES ROBINSON, MAURICE
PEACOCK, FRED W. SMITH, SHER-
MAN DAVIS, FRED C. MILES,
WALTER L. TURNER, JR., G. J.
WEIHOFEN, GEORGE JOHNSON,
LIBRARIAN. EDITH C. STONE,
EDITORIAL ASSISTANT. ELAINE
C. FARRAR.

SUBSCRIPTIONS, INCLUDING 52
REGULAR WEEKLY ISSUES, AND
SPECIAL DAILY EDITIONS PUBLISHED FROM TIME TO TIME IN
NEW YORK OR IN PLACES OTHER
THAN NEW YORK, PAYABLE IN
ADVANCE AND POSTAGE FREE.
UNITED STATES, U. S. POSSES-
SIONS AND CANADA: 1 YEAR,
\$6.00; 2 YEARS, \$10.00; OTHER
COUNTRIES NOT INCLUDING
DAILY EDITIONS: IN WESTERN
HEMISPHERE 1 YEAR \$10.00; 2
YEARS \$16.00; OTHER COUNTRIES
1 YEAR \$15.00; 2 YEARS \$25.00.
SINGLE COPIES, 50 CENTS EACH.
H. E. McCANDLESS, CIRCULATION
MANAGER, 30 CHURCH STREET,
NEW YORK 7.

EDITORIAL

Railroads Enter a New Era 1

REVIEW AND OUTLOOK SECTION

Stage Set for Large-Scale Improvements, by J. G. Lyne 4
A Year of Labor Turmoil and Wage Boosts, by Charles Robinson
and W. H. Schmidt, Jr. 8
Work Equipment Purchases Down in 1946, But Need for Mech-
anization Grows, by Neal D. Howard 12
Maintenance Expenditures in Down Trend, by Merwin H. Dick 16
New Power Shows Way to Economies, by H. C. Wilcox 21
Box, Hopper and Reefer Supply Inadequate, by C. P. Peck 25
Packin' 'em in — But with a Flourish, by W. H. Schmidt, Jr. 28
Freight Traffic Sets Peace-Time High, by Charles Robinson 33
Electrical Applications Increase Rapidly, by Alfred G. Oehler 37
Much Ahead in Modern Signaling, by John H. Dunn 39
Shop Tool Programs Going Ahead, by H. C. Wilcox 43
Traffic Large, Earnings Down in Canada, by our correspondent
in Ottawa 45
Mexican Railways Had Unsettled Year, by our correspondent
in Mexico 49
Railway Materials — How Much and When?, by Fred W.
Smith 52
A Review of Railway Operations in 1946, by Dr. J. H. Parmelee 58

STATISTICAL SECTION

Railroad Equities Are Still Depressed, by J. G. Lyne 68
1946 Railway Buying Near 1923 Peak, by Fred W. Smith 74
Equipment Price Increases Restrained 78
1946 Construction Covered Wide Range, by George E. Boyd .. 79
Fast Changes in Communications, by John H. Dunn 87
Construction of Signaling Was Stepped Up in 1946, by Maurice
Peacock 92
Line Abandonments Up Slightly in 1946, by George E. Boyd .. 100
97,730 Freight Cars Ordered in 1946, by Fred C. Miles 102
Passenger Car Orders for Year Total 1,986, by Elaine C. Farrar 107
Locomotives Ordered and Built in 1946, by Fred C. Miles 110

GENERAL NEWS 114

*Railway Age is a member of Associated Business Papers (A. B. P.) and Audit
Bureau of Circulation (A. B. C.), and is indexed by the Industrial Arts Index
and by the Engineering Index Service.*



PRINTED IN U. S. A.

CONTROL

ANY LENGTH OF TERRITORY
ANY NUMBER OF FUNCTIONS
FROM ANY SELECTED POINT
OVER A TWO-WIRE MULTIPLE LINE WITH

"UNION" C.T.C.

Whether it be short, separated territories, or an entire operating district, movement of traffic can be expedited and operating cost reduced by "Union" Centralized Traffic Control. And no matter how numerous the signaling and switching functions, "Union" C.T.C. can handle them.

"Union" C.T.C. in combination with "Union" Coded Carrier Control makes possible the control of any length of territory and any number of functions from any selected point . . . over a two-wire multiple line. Often, existing wires can be used, cutting installation cost still further. Too, these same two wires may be engineered for telephone or telegraph service.

"Union" C.T.C. is ideally suited to long range planning, with immediate results. There are numerous instances of progressive installations, where one extremity of the project has been C.T.C. equipped and the control machine located at the other. Sections completed subsequently were controlled by the same machine.

These are features of Union Centralized Traffic Control which contribute to its primary ones of increasing track capacity, stepping up productive use of rolling stock, affording more car miles per day and more gross ton miles per train hour, maintaining schedules, and even improving them!

"Union" representatives will welcome the opportunity to tell you how Centralized Traffic Control can be fitted to your program of improved operations.

UNION SWITCH & SIGNAL COMPANY

SWISSVALE



PENNSYLVANIA

NEW YORK

CHICAGO

ST. LOUIS

SAN FRANCISCO

"UNION"



SAVES YOU MORE THAN IT COSTS

RAILWAY AGE

Railroads Enter a New Era

Our railroads have entered a new era because the nation has entered a new era. The railroads were returned to private operation on March 1, 1920, about 16 months after the Armistice. It has been about 16 months since V-J Day. Hence, the beginning of the New Year 1947 corresponds in this post-war period with the time when the railroads were returned to private operation in the last post-war period.

Some developments have occurred faster in this than in the last post-war period. Railway employees were given a large advance in wages 18 months after the Armistice in May, 1920. They were given a large advance in wages effective January 1, 1946, about 4½ months after V-J Day, and another advance in May, 1946. The railways were given a large advance in rates on September 1, 1920, about 22 months after the Armistice. They were given a small advance in rates effective July 1, 1946, and a larger advance effective January 1, 1947, about 16½ months after V-J Day. They lost nothing by the delay in advancing rates in the last post-war period, because their government guarantees of net return continued until the advance in rates on September 1, 1920. They lost heavily by the delay in advancing their rates in this post-war period, because they had no government guarantees of net return.

Similarity to 1919-20

On the whole, however, the economic pattern followed since V-J Day has been similar to that followed after the Armistice. The year which has just ended corresponded roughly with 1919. The year we have just entered corresponds roughly with 1920. Business was more adversely affected by strikes in 1919 than in any previous year. It was again more adversely affected by strikes in 1946 than in any previous year. Production and traffic declined in 1919. Production and traffic declined following V-J Day. They increased and exceeded all previous records in 1920. Their trend was definitely upward in the latter part of 1946, and they may exceed all previous records in 1947.

The depression-minded not only predicted that freight traffic would decline, but that it would decline greatly, following World War II—probably to the level of 1941. They foresaw a slump in construction and production and eight to twelve million unemployed early in 1946. Their prophecies completely failed of fulfillment. Em-

ployment reached a new high level. Freight traffic handled by the railroads last year was, excepting in the recent war years, the largest in history—40 per cent larger than it averaged in 1923-1929; 30 per cent larger than in 1929, and 25 per cent larger than in 1941. It would have been larger still if there had not been so many strikes, especially in the coal mines, and if the railroads could have handled more. And there was no sign at the beginning of the New Year that the demands of freight traffic would not continue exceeding railroad capacity indefinitely.

Few Left Who Recall War I

As the year 1947 corresponds roughly in this post-war period with 1920 in the last post-war period, it is necessary to recall what occurred not only before the Great Depression, but before 1920, to make a rational appraisal of the prospective future. The National Industrial Conference Board has pointed out that "of the 142 million individuals now living in the United States, only about 32 million can claim any adult experience with World War I. The other 110 million were not born on November 11, 1918, or else had not reached the age of 21 on that day." This is a significant reminder that few men now active in business know from personal experience the conditions and problems that had to be dealt with in the last post-war period, and that a much smaller number have any real, intimate knowledge of what occurred before that period. Most of them do know what occurred during the recent depression and war.

Hence, their point of view, their expectations, their ideas regarding how we should deal with the conditions and problems with which we are now confronted, are likely to be quite different from those of men who know from actual experience what occurred before as well as after 1920.

The most fundamental factor determining economic needs and developments is population. Population determines how many people have to be provided for and how many workers there are to provide for them. The population of the United States has increased about 35 million since 1920—as much as it increased from 1896 to 1920. But there have been great differences between the periods 1896 to 1920 and the period 1920 to 1947. The former was a period of almost uninterrupted increase of construction, production and traffic.

Annual railway freight traffic increased 319 billion ton-miles—from 95 billion in 1896 to 414 billion in 1920. To cope with the rapidly increasing traffic railway capacity was greatly expanded. Investment was increased \$10.3 billion—from \$9.5 billion in 1896 to \$19.8 billion in 1920. Nevertheless, "car shortages" were chronic during the latter part of the period, either because the increase in investment was inadequate, or because it was not made for the right purposes, or because the most efficient use practicable was not made of the facilities made available by the increased investment.

Much Catching Up to Do

The 27 years since 1920 have included more than a decade of the worst depression in history, during which expansion of construction, production and transportation was almost halted. Investment in the railways, although costs were lower, increased 50 per cent more in the 24 years ending with 1920 than in the 24 years ending with 1944—\$10.3 billions as compared with \$6.7 billions. At the peak of war-time traffic in 1944 the railways handled 327 billion more ton-miles than in 1920—a slightly larger increase than the gain of 319 billion ton-miles in 1920 over 1896. But even statistics showing the enormous increases in production and traffic during the war do not conceal the effects of the lags in production and traffic during the depression. The railways handled during the war years a larger part of the total traffic than for years before. But the increase in railway ton-miles per capita from 1896 through 1920 was 2,541 while from 1920 through 1944 it was only 1,477.

Because of excessive increases in and unbalancing of wages and prices the "boom" in 1920 was followed by a sharp decline of construction, production, and traffic from which there was complete recovery in 1923. Perhaps the "boom" we are now having also will be short, especially if organized labor succeeds in getting the additional round of wage increases which it is now seeking. One reason for doubting this is that, although prices in general had not become as high as in 1920, the Bureau of Labor Statistics reported the beginning last September of a general decline of wholesale prices.

But one thing experience in 1920 proved—viz., that either the railroads had not enough facilities or that they were not using them with maximum practicable efficiency. And experience proved conclusively that the railways had not enough facilities to handle the traffic offered them last year, and that, if traffic demands are going to continue increasing, a big additional investment will have to be made in railroad plant to increase its capacity adequately.

There is a wide difference between the "car shortages" formerly reported and those being reported now. During the period of some 20 years ending with 1923, reports on the freight car situation included large "surpluses" as well as large "shortages." This was due to faulty distribution of cars either because the physical means of distributing them were not adequate or because the methods of distribution used were inefficient. That the shortages of cars reported within recent years have been the real McCoy is shown by the fact that they have been accompanied by virtually no surpluses.

When the maximum 1946 shortage of 39,089 cars was reported for November 2, the surplus reported was only 1,451 cars. The final elimination of car shortages in the last post-war period in 1923 was largely due to improvement in the distribution of cars caused by better work by the Car Service Division and by the creation of regional shippers boards which immediately began cooperating effectively with the Car Service Division. Doubtless there is room now for improvement in the work of the Car Service Division and for better cooperation by shippers. But there is no such opportunity now as there was in the last post-war period for, in effect, increasing the car supply by making better use of it.

Another important difference between the last and the present post-war periods is in conditions affecting the opportunity of the railroads to effect economies in operation. There was a great increase of operating expenses in 1918, 1919 and 1920 due to decline of efficiency under government operation. The increase in ton-miles of freight traffic handled in 1920 as compared with 1916 was 13 per cent, in passenger-miles 35 per cent and in number of employees 23 per cent—or almost 376,000. The increase in ton-miles of freight traffic handled in 1945 as compared with 1941 was 43 per cent, in passenger-miles 213 per cent and in number of employees 25 per cent—about 281,000. Passenger traffic was smaller in 1923 than in 1920, but freight traffic was larger and exceeded all previous records. And yet the railroads effected a large saving by reducing the number of employees from an average of 2,070,000 in 1920 to 1,900,000 in 1923, and never afterward had more than 1,822,000. Since there was no decline in efficiency, and therefore no increase in operating expenses due to it, in the recent war and post-war periods, there will be less opportunity to reduce expenses by increasing efficiency in the years immediately ahead.

Why Large New Investment Is Needed

Railroad investment is now about \$7.5 billion more than in 1920. But almost all this increase in investment was made during the last post-war period. The increase in 1930 over 1920 was \$6.6 billion. This increase in investment not only provided needed increased capacity, but helped to effect large economies in operation. The rehabilitation of railway properties was accomplished not only by increase in investment but by increase in expenditures for maintenance. Total annual expenditures for maintenance averaged about \$1.1 billion in the decade ending with 1919 and about \$2.2 billion in the decade ending with 1929.

Increased by 35 million since 1920, the nation's population is demanding a much greater increase of construction, production and transportation per capita than in 1920 to 1931 (1) to remedy shortages accumulated during the Great Depression and the recent war and (2) to raise standards of living as they were raised in the quarter century before 1920 and during the post-war period 1920-1930. The accomplishment of this, if it is accomplished, will require a vast expansion of the plant of construction and production as well as of its output. It will require a corresponding expansion of transportation and especially of railroad transporta-

tion. No such expansion of plant and its output can be accomplished without a huge increase of investment in means of construction, production and transportation.

Where Will the Money Come From?

The industries devoted to construction and production can get the capital for making such a huge increase of investment only, directly and indirectly, from profits. And yet labor leaders are demanding that *prospective* profits be curtailed by more large advances in wages. But labor cannot eat its cake and keep it. Industry cannot pay out in wages the profits it otherwise would earn and at the same time earn and use these profits in effecting the huge expansion of the plant of construction and production required to remedy the shortages which have accrued and to raise standards of living as they were raised before the Great Depression.

If the industries devoted to construction and production are going greatly to expand their plant and its output, how are the railways going to raise the capital essential to expanding their plant enough to meet the increasing demands of traffic? In the ten years ending with 1930 when the railroads increased their investment more than \$6 billion, they increased their net capitalization (outstanding in the hands of the public) by only about \$2 billion—funded debt about \$1,600 million, and stock about \$500 million. Only about one-third of the capital they invested was raised by selling securities and about two-thirds of it was derived from net earnings. After so many of them became bankrupt during the depression they will be strongly indisposed to increase their bonded indebtedness in future. Most of them would be unable to finance by the issuance of stock without largely increasing their dividends, as is shown by the present market prices of their stocks. It would appear that they will have to do their financing principally from net earnings, as in the last post-war period.

The need for a big increase of investment in railroad plant, if the period we have now entered is going to be a period of greatly expanding construction, production and prosperity in the United States, has been conclusively demonstrated by the experience of the railroads during the last year. They have been unable to handle as much freight traffic as during the war years because, owing to differences in the character of the traffic and in other conditions, it is impossible to handle as much traffic with given facilities in time of peace as in time of war. So the nation is squarely confronted with the fact that, if it is to have during this period the large increases of construction and production needed, the railroads must be given the opportunity to expand which can be afforded them only by larger net earnings than those made during the last post-war period.

If the expansion of construction and production is going to be large enough, first, to remedy the unprecedented shortages of almost everything that have accumulated since 1930, and, second, to raise standards of living as they were raised before 1930, the handling of future traffic will require a much larger expenditure for railroad rehabilitation, improvement and expansion in this post-war decade than was made in the last post-war decade.

Railway managements should go forward as long as

the demands of freight traffic continue exceeding previous peace-time records with a program of expenditure based upon the assumption that there is going to be such an expansion of construction and production. Otherwise they may and very likely will find themselves under attack for having let railway capacity become a bottleneck restricting construction and production. It may be found, partly because of decline in passenger earnings, that the recent advance in freight rates will not provide enough net earnings for such large expenditures. In that case railway managements should return to the Interstate Commerce Commission for another advance in rates and present fully to the public, as well as the Commission, the reasons why they require it.

Shortages Breed Hostility

Nothing ever created so much hostile sentiment toward the railroads as their chronic failure during the long period of years ending with 1923 to meet all the demands of freight traffic. Nothing ever improved sentiment toward them so much as their complete elimination of such shortages beginning in 1923. The program of expansion they carried out during the last post-war period left them with large surplus capacity throughout the great depression. And they were criticized then for having expanded too much. But without that program of expansion they would have been wholly unable to have met demands during the recent war.

It is not reasonable to assume, in view of existing economic conditions, that the nation within the next decade, or the next two decades, will have any such profound and prolonged depression as in the decade ending with 1940. It is much more reasonable to assume that it will have another period of prosperity such as prevailed during the thirty years ending with 1929. Everybody in business should proceed upon the assumption that this is what will occur and courageously do everything possible to make it occur. If private enterprise, including the railways, intelligently and courageously does everything practicable to make it occur; it probably will occur. If private enterprise, including the railways, instead of causing a prolonged period of prosperity, is so conducted that another great depression occurs, this country probably will join the other countries of the world on the road to socialism, in which case private ownership of railways will be unable to survive.

At the beginning of last year when a post-war depression was still being predicted, the *Railway Age* concluded an editorial with these statements:

"The railways, in entering 1946, apparently have little or no more reason than any other large American industry for doubt regarding their future or for hesitating to plan for it upon the assumption that it will be a future of opportunity. . . . There is evidence, including the recent attitude of Congress, that the tide of public sentiment is beginning to run strongly against socialistic policies and in favor of giving private enterprise the opportunity that the national welfare requires that it should be given."

Developments throughout the past year, including the recent election, have strongly supported the views then expressed. Never in history did conditions apparently present a greater opportunity to the managements of American industry, including the managements of the railways, than at the beginning of 1947.

Stage Set for Large-Scale Improvements

Railroads realize acute need for plant modernization and expansion and have the funds to initiate largest program of betterments in history—Rate rise a big help

EXPERIENCE indicates that the principal factors which produce a high volume of buying by the railroads—for the purpose of rehabilitation, raising the standard of maintenance, and improving the efficiency and convenience of service—are four in number, viz.:

1. A plentiful supply of ready funds in the treasury and/or
2. The ability to get funds easily by the sale of securities on favorable terms;
3. A traffic volume which is taxing the capacity of existing facilities and/or
4. The promise held out by plant improvements to improve the railroads' competitive position or to effect large economies in operating expenses.

All of the foregoing factors (with the exception of a qualifying reservation regarding No. 2) have been operating with a wide-open throttle in the railroad industry ever since Pearl Harbor. The limitation on buying by the railroads, for five years past, has not lain in their lack of funds or in any backwardness on their part to spend, but has originated

By J. G. LYNE

*Vice-President & Asst. to Chairman,
Simmons-Boardman Publishing Corp.;
Assistant to Editor, Railway Age*

solely from the inability of the producers to supply the products and materials desired in the volume which the railroads have been eager to acquire.

Equipment Easy to Finance

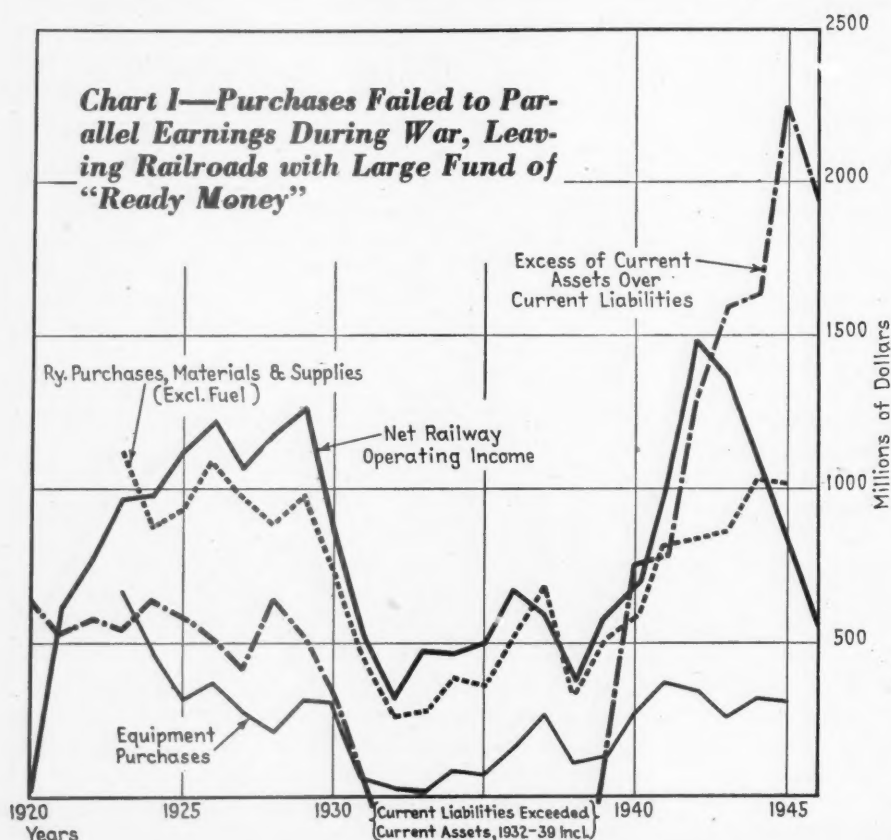
The qualification respecting factor No. 2—the carriers' ability to raise capital funds easily by the sale of securities on favorable terms—applies only to stocks and bonds, not to equipment trust certificates. The experience of the 'thirties is not conducive to further efforts by the railroads, at least for the time being, to raise much new money by the sale of bonds, and the general level of stock prices at a discount of one-third or more below par has precluded large-scale financing by the sale of stock. Equipment trust obligations,

on the other hand, are welcomed with avidity in the market; with the result that interest rates on such issues are comparable to those of government bonds. The railroads, in short, can easily lay hands on all the money they can or would care to use for the purchase of equipment. Their long-run prospects for a supply of new "outside" money for capital expenditures for improvements to property other than equipment are not so clear. On the other hand, whatever the long-run supply of funds for improvements may be (a question dealt with in an article further on in this issue, which reviews the railways' financial situation), there is certainly no lack of present funds for this purpose.

In short, the extent of the railways' purchases from manufacturers in 1947 for the purpose of increasing their traffic capacity, and rehabilitating and improving their plant, promises to be circumscribed only by the capacity of the manufacturers to produce the materials and products the railroads wish to acquire. Limitation of expenditures for reasons of a shortage of funds, or hesitancy in expending them, has not prevailed since 1941, and there is no reason to expect that this consideration will play a deciding role in 1947. This is not to say, of course, that some products and materials may not be available in excess of the railroads' willingness to buy them—but, when it comes to the things the railroads really want, the producer rather than the buyer will be the one who will put the ceiling on the magnitude of transactions—just as has been the case ever since Pearl Harbor.

Lots of "Ready Money"

Let us examine the evidence which leads to the foregoing conclusions. Chart I herewith shows three significant series of figures—(1) net railway operating income for 1920 and each year thereafter; (2) annual purchases by the railways, excluding fuel, for 1923 and each succeeding year (such data not being available prior to 1923), with equipment purchases shown separately; and (3) the excess of current assets over current liabilities at the end of each year beginning with 1920. This chart makes instantly clear the well-known peace-time correlation between net railway operat-



ing income and purchases from manufacturers—which so closely parallel each other that nobody will question the existence of a casual relationship between them. The chart also shows, however, that, since 1941, this parallelism has been suspended. In the years 1942-45 net railway operating income soared far above purchases, for the simple and obvious reason that limitations on available products made it impossible in those years for the railroads to spend as much money as they should have spent to keep their properties in the shape called for by the volume of business they were then doing and the earnings which this business produced.

The railroads held on to these funds which they should have spent but could not—a fact which is evidenced in the chart by the line which portrays the excess of current assets over current liabilities. Whereas, throughout the 'thirties, current liabilities were greater than current assets, by the end of 1945 that unhealthy condition had been reversed to the extent that current assets exceeded current liabilities by almost \$2¼ billion. Such a degree of liquidity was an unprecedented experience for the railroads. At no time in the relatively prosperous 'twenties, as the chart shows, did the excess of current assets over current liabilities attain a total as large as \$650 million. This is another way of saying that, viewed from the standpoint of ready money, the railroads as a whole are today in a position more than three times as strong as they were at any time in the 1920's.

Will Funds Be Hoarded?

What, then, is going to happen to the more than \$1.3 billion by which present quick assets exceed those of the 'twenties? Have the railroads decided, perhaps, from their unhappy experiences of the 'thirties that they now need to have three times as much ready money on hand as they did in the 'twenties; Will they seek to hold their quick assets at or near the present level, and trim future expenditures to match the net railway operating income earned hereafter; or will they, on the contrary, let part or all of the war-time accumulation gradually melt away as they make expenditures disproportionately large in relation to their net railway operating income to be earned hereafter, thus catching up with the rehabilitation and improvements which they should have made during the war years but could not?

There is no evidence upon which to base categorical answers to these questions. It is, however, a patent fact that purchases by the railroads in 1946 did not fall as net railway operating income declined. Net railway operating income

Clear Board!

With post-war railroad traffic volume affording convincing evidence that America has bidden good-bye and good riddance to the policies which kept production low and unemployment high throughout the thirties, it has become imperative that railroad plant, shrunken to conform to the meager demand of the 'thirties, be now expanded to correspond to the new level of national economic vitality.

The railroads have no mere war-time let-up in maintenance and improvement to counteract, but must also catch up for the shrinkage they suffered in the 'thirties. Armed with large funds husbanded from war-time earnings, plus the added encouragement of recent modest increases in freight rates, the railroads appear to be ready to press forward with the biggest program of rehabilitation and improvement in their history.

was reduced from \$850 in 1945 to \$451 million in 1946, but the dollar volume of purchases in 1946 exceeded that of 1945. As a result of maintaining expenditures at a level higher than could be justified by current earnings, the railroads suffered their excess of quick assets to fall from \$2,237 million at the beginning of 1946 to \$1,941 million at the end of September—a reduction of almost \$300 million. It is quite possible, except for their lively expectation, which eventually proved true, that their freight rates were going to be substantially increased, that they would have pared their outlays to the level of their reduced 1946 earnings. Be that as it may, it is most significant that, having the hope for improved earnings ahead, they were willing to let their quick assets position decline by more than \$300 million in less than a year while they continued their

expenditures at a relatively high level. With higher net railway operating income for 1947 assured from the 17.6 per cent increase in freight rates, which came into full effect January 1, there appears good reason to believe that the railroads might well be content to see their quick assets decline still further so long as nothing happens to arouse apprehension as to the future.

When Will Spending Stop?

There is no way of knowing in advance at just what point of decline in their quick assets the railroads would consider their security to be threatened—but it appears highly probable that expenditures beyond the compass of current earnings may continue at least as long (1) as the prospective earnings outlook remains reasonably bright and (2) until a substantial part of the subnormal outlays (i.e., relative to earnings) of the war years have been cancelled. Purchases by the railroads at a volume in disproportionately large ratio to net railway operating income may, therefore continue for a period of, perhaps, five years or even longer—which is to say that there is a reasonable prospect that railway earnings in the years immediately ahead will be greater than at any previous period in the country's history.

How much traffic and net railway operating income can the railroads expect in 1947? The Bureau of Transport Economics & Statistics of the Interstate Commerce Commission has calculated that, with freight traffic for a full year at the level it attained in July-September 1946, the recent freight rate increases would yield the railroads \$1,004 million of additional revenue.

Dr. J. H. Parmelee, director, Bureau of Railway Economics, estimates the increase at \$970 million, based on a presumptive traffic in 1947 of 584 billion ton-miles. In the 12 months ended

Table I—Selected Balance Sheet Items, Class I Line-Haul Railways

| Year | Cash and Temporary Cash Investments (000) | Total Current Assets (000) | Total Current Liabilities (000) | Excess of Current Assets over Liabilities (000) | Total Long-Term Debt (000) | Total Corporate Surplus (000) |
|-------|---|----------------------------|---------------------------------|---|----------------------------|-------------------------------|
| 1929* | \$677,955 | \$1,717,953 | \$1,200,984 | \$516,969 | \$11,138,121 | \$5,029,171 |
| 1930* | 592,071 | 1,510,975 | 1,162,170 | 348,805 | 11,174,816 | 4,577,730 |
| 1931 | 419,510 | 1,213,350 | 1,147,239 | 66,111 | 11,153,678 | 4,395,508 |
| 1932 | 379,136 | 1,063,271 | 1,130,731 | 67,460 | 11,247,777 | 4,094,531 |
| 1933 | 394,117 | 1,034,560 | 1,261,382 | — 226,822 | 11,112,055 | 3,900,883 |
| 1934 | 380,212 | 1,058,326 | 1,471,326 | — 412,995 | 11,041,472 | 3,714,302 |
| 1935 | 439,403 | 1,086,467 | 1,670,767 | — 584,300 | 10,821,788 | 3,507,220 |
| 1936 | 578,343 | 1,292,421 | 1,885,574 | — 593,153 | 10,452,266 | 3,349,889 |
| 1937 | 392,486 | 1,143,990 | 1,937,830 | — 793,840 | 10,686,814 | 3,126,391 |
| 1938 | 480,550 | 1,120,968 | 2,243,961 | — 1,122,993 | 10,558,723 | 2,739,742 |
| 1939 | 578,359 | 1,292,705 | 2,555,903 | — 1,263,198 | 10,352,646 | 2,563,879 |
| 1940 | 680,400 | 1,442,142 | 697,200† | 744,942 | 11,288,311† | 2,474,249 |
| 1941 | 904,600 | 1,914,544 | 1,115,320† | 799,224 | 11,186,063 | 2,666,625 |
| 1942 | 1,736,933 | 3,065,093 | 1,806,030 | 1,259,063 | 10,879,476 | 3,167,986 |
| 1943 | 2,807,275 | 4,497,065 | 2,923,078 | 1,573,987 | 10,462,770 | 3,748,508 |
| 1944 | 2,753,560 | 4,488,042 | 2,844,042 | 1,643,832 | 9,830,186 | 4,327,893 |
| 1945 | 2,545,909 | 4,345,830 | 2,108,245 | 2,237,585 | 9,286,001 | 4,608,846 |
| 1946 | 2,210,775 | 3,750,603 | 1,809,457 | 1,941,146 | (1946 totals are Sept. 30) | |

* Switching & Terminal Companies Included.

† In 1940 and thereafter long-term debt in default is included in long-term debt. In years prior thereto it is included in current liabilities. Likewise in 1940 and thereafter default interest is removed from current liabilities to deferred liabilities.

‡ Tax liability included in 1941 and thereafter.

October, 1946, the railroads earned \$470 million of net railway operating income which, however, would have been only \$162 million except for the "carry back" provisions of the excess profits tax. Passenger traffic will doubtless be less in 1947 than in 1946 (during the early part of which, it will be recalled, there were heavy troop movements); and there will be \$100 million of additional expense to pay the increased payroll taxes called for under the Crosser Act. On the basis of current operating expenses, it would be possible and even reasonable to forecast net railway operating income for 1947 at a very modest figure indeed, perhaps not more than \$700-\$800 million.

Hope for Increased Net

Following World War I, however, when the railways instituted a large program of capital expenditure, their operating ratio was steadily reduced, as was the unit cost per ton-mile. If new equipment and plant is forthcoming without undue delay this factor may become strongly into play in 1947. If it does so, the railroads might earn as much as

\$1 billion of net railway operating income. This is insufficient to constitute a "fair return" on a total investment of \$28 billion, but it is more money than the railroads earned in 1945 and a great deal more than they earned in 1946—in both of which years their purchases exclusive of fuel and equipment exceeded \$1 billion and would have been greater if more products and materials had been available.

It's Up to the Producers!

Altogether, the available evidence points to the conclusion that in 1947 the railroads will have at their disposal ample funds with which to make purchases on a scale larger than in any year in their history—provided only that the articles they desire are available from the producers in the quantities required. The factors Nos. 1 and 2 which govern the volume of railway purchasing, as set forth at the beginning of this discussion, having thus appeared as favorable, the inquiry may now proceed to factors Nos. 3 and 4, i.e., whether or not traffic is pressing on the capacity of available facilities and whether proposed improve-

ments promise to prove helpful in meeting competition or in offering attractive savings in operating expenses.

With the railroads having suffered from car shortages practically all year long in 1946, the fact that traffic exceeds the capacity of existing facilities is so obvious as to require no elaboration. The extent to which improved plant and equipment afford the railroads opportunities to save money in operating expenses and to meet the threat of competition is a matter which can be dealt with satisfactorily only in detail, department by department, and other articles in this issue provide this information.

Incentives Needed

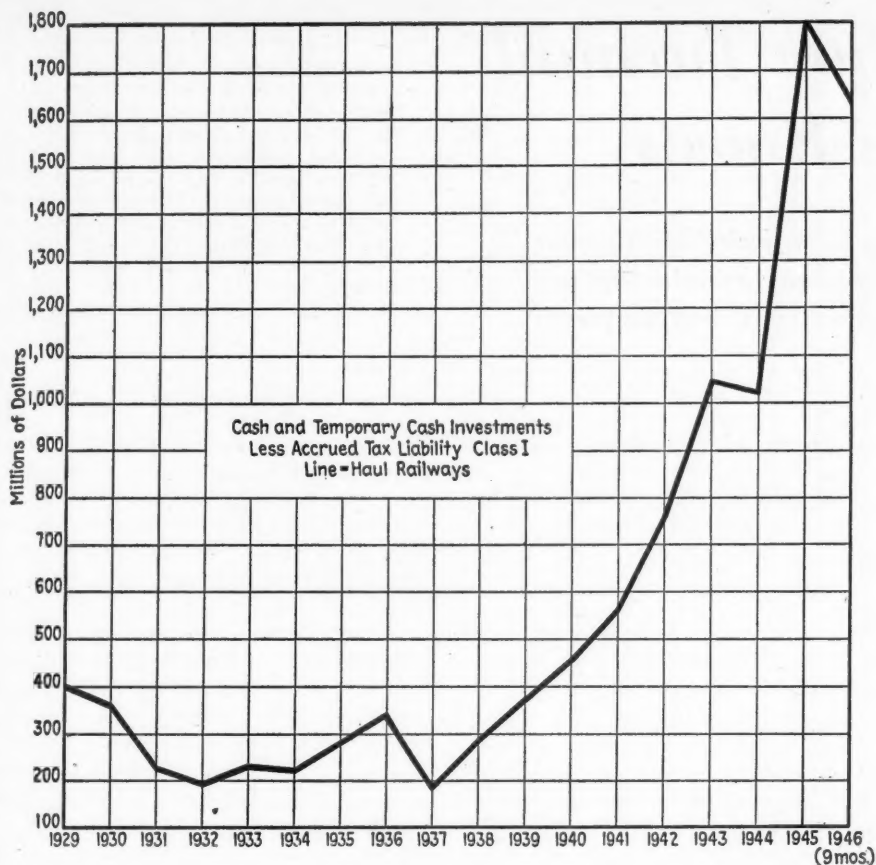
There was so much extra transportation capacity lying around unused during the 'thirties, that people forgot, temporarily, how important efficient transportation is to all the nation's economic activities. They also forgot that transportation capacity is not just a free gift of nature—it has to be provided by the hard work and thrift of people. And,

Table II—Increase in Cash and Current Assets of Individual Large Railroads

| | Cash & Temporary Cash Investments Sept. 30 | | Inc. or Dec. % | Total Current Assets | | Total Current Liabilities | | Excess of Current Assets over Liabilities | | Inc. or Dec. % |
|-----------------------------------|--|-------------|----------------|----------------------|-------------------|---------------------------|-------------------|---|-------------------|----------------|
| | 1946 | 1941 | | End of Sept. 1946 | End of Sept. 1941 | End of Sept. 1946 | End of Sept. 1941 | End of Sept. 1946 | End of Sept. 1941 | |
| Alton..... | \$9,962,078 | \$1,170,765 | +751 | \$16,915,348 | \$3,464,763 | \$8,801,139 | \$3,339,725 | \$8,114,209 | \$125,038 | + 6,389 |
| Atchison, Topeka & Santa Fe..... | 153,223,025 | 58,657,402 | +161 | 225,723,524 | 118,838,956 | 99,055,764 | 41,283,880 | 126,667,760 | 77,555,076 | + 63 |
| Atlantic Coast Line..... | 18,742,099 | 12,823,694 | + 46 | 44,553,493 | 22,763,323 | 23,384,071 | 11,024,065 | 21,169,422 | 11,739,258 | + 80 |
| Baltimore & Ohio..... | 59,450,251 | 32,005,796 | + 86 | 104,242,199 | 57,593,956 | 53,750,396 | 28,546,091 | 50,491,803 | 29,047,865 | + 74 |
| Boston & Maine..... | 1,051,749 | 6,610,868 | - 84 | 27,207,131 | 15,020,621 | 15,908,332 | 11,332,144 | 11,298,799 | 3,688,477 | + 206 |
| Central of Georgia..... | 19,122,869 | 2,060,260 | +828 | 30,107,908 | 6,605,629 | 6,787,946 | 4,085,946 | 23,319,962 | 2,519,683 | + 826 |
| Central of New Jersey..... | 6,924,832 | 7,708,699 | - 10 | 18,011,554 | 13,296,299 | 11,342,796 | 7,156,374 | 6,668,758 | 6,139,925 | + 9 |
| Chesapeake & Ohio..... | 40,317,506 | 39,376,413 | + 2 | 81,442,652 | 70,345,516 | 52,994,922 | 37,934,360 | 28,447,730 | 32,411,156 | - 12 |
| Chicago & Eastern Illinois..... | 4,584,784 | 2,546,584 | + 56 | 9,673,426 | 4,983,136 | 5,726,060 | 2,260,684 | 3,947,366 | 2,722,272 | + 45 |
| Chicago & Northwestern..... | 28,717,175 | 30,861,791 | - 7 | 60,904,381 | 52,251,756 | 34,994,537 | 19,903,143 | 25,909,844 | 32,348,613 | - 20 |
| Chicago, Burlington & Quincy..... | 46,880,291 | 21,279,903 | +120 | 101,447,016 | 46,448,243 | 59,541,025 | 18,945,620 | 41,905,991 | 27,952,623 | + 50 |
| Chicago Great Western..... | 7,762,724 | 2,595,208 | +199 | 11,697,841 | 5,388,421 | 6,128,812 | 3,428,785 | 5,569,029 | 1,959,836 | + 184 |
| Chicago, Mil., St. P. & P..... | 48,061,180 | 32,345,253 | + 49 | 100,109,815 | 55,054,591 | 35,291,837 | 22,886,437 | 64,817,978 | 32,168,154 | + 101 |
| Chicago, Rock Island & P..... | 76,409,417 | 15,102,997 | +406 | 105,322,800 | 29,257,976 | 29,624,082 | 15,559,216 | 75,698,718 | 17,698,760 | + 328 |
| Chicago, St. P., M. & O..... | 3,585,456 | 1,951,559 | + 83 | 8,037,093 | 4,815,051 | 5,188,571 | 2,868,598 | 2,848,522 | 1,946,453 | + 46 |
| Delaware & Hudson..... | 5,243,029 | 5,660,571 | - 7 | 13,539,791 | 10,358,727 | 6,406,474 | 4,683,606 | 7,133,317 | 5,673,121 | + 26 |
| Delaware, Lackawanna & W..... | 11,664,089 | 5,320,447 | +119 | 23,045,765 | 10,609,370 | 10,166,160 | 10,532,133 | 12,879,605 | 77,237 | +16,575 |
| Denver & Rio Grande Western..... | 29,774,057 | 3,968,946 | +650 | 47,881,024 | 9,406,809 | 22,280,693 | 9,329,786 | 25,600,331 | 77,023 | +33,137 |
| Duluth, Missabe & I. R..... | 16,587,562 | 23,444,610 | - 29 | 20,653,909 | 11,795,009 | 12,594,792 | 9,723,692 | 8,388,991 | 16,702,348 | - 50 |
| Elgin, Joliet & Eastern..... | 13,757,173 | 14,142,496 | - 3 | 17,766,324 | 16,565,577 | 7,932,996 | 8,996,297 | 9,883,328 | 7,569,280 | + 30 |
| Erie..... | 22,196,945 | 19,758,387 | + 12 | 45,249,721 | 37,490,112 | 26,864,427 | 17,281,697 | 18,385,294 | 20,208,415 | - 9 |
| Grand Trunk Western..... | 1,369,173 | 2,182,538 | - 37 | 8,242,904 | 6,715,617 | 9,115,763 | 4,958,783 | 8,772,859 | 1,759,836 | + * |
| Great Northern..... | 39,557,438 | 31,232,705 | + 27 | 76,276,369 | 48,853,112 | 34,342,146 | 24,685,298 | 41,934,223 | 24,176,814 | + 74 |
| Gulf, Mobile & Ohio..... | 8,255,438 | 6,033,164 | + 37 | 16,053,909 | 11,795,009 | 7,827,633 | 4,718,508 | 8,226,276 | 7,076,501 | + 16 |
| Illinois Central..... | 74,627,611 | 21,359,849 | +249 | 113,351,974 | 48,241,748 | 68,382,739 | 27,873,398 | 44,969,235 | 20,368,351 | + 121 |
| Lehigh Valley..... | 11,920,278 | 14,131,926 | - 16 | 25,448,310 | 19,537,656 | 13,769,763 | 14,323,855 | 11,678,547 | 5,213,801 | + 124 |
| Long Island..... | 4,583,132 | 950,638 | +382 | 12,289,741 | 4,604,599 | 8,699,434 | 4,865,790 | 3,590,307 | - 261,191 | + * |
| Louisville & Nashville..... | 48,654,860 | 34,026,440 | +43 | 79,338,832 | 53,292,968 | 35,974,083 | 21,809,450 | 43,364,749 | 31,483,518 | + 38 |
| M., St. P. & S. Ste. Marie..... | 13,157,213 | 5,603,059 | +135 | 19,173,332 | 9,014,803 | 7,362,146 | 16,129,982 | 11,811,186 | - 7,115,179 | + * |
| Missouri-Kansas-Texas..... | 11,368,699 | 3,381,480 | +236 | 22,335,089 | 7,142,237 | 17,301,441 | 6,506,292 | 5,033,648 | 635,945 | + 692 |
| Missouri Pacific..... | 54,255,237 | 28,300,753 | + 92 | 86,379,841 | 49,803,883 | 36,550,881 | 11,676,182 | 49,828,960 | 37,247,701 | + 33 |
| New York Central..... | 121,670,568 | 39,773,886 | +206 | 247,186,085 | 125,401,909 | 118,101,983 | 76,037,496 | 129,084,102 | 49,364,313 | + 161 |
| New York, Chicago & St. L..... | 17,326,435 | 5,630,806 | +208 | 32,009,046 | 22,686,088 | 13,732,220 | 16,499,315 | 18,276,826 | 6,186,773 | + 195 |
| N. Y., N. H. & Hartford..... | 5,317,143 | 8,279,120 | - 36 | 74,417,102 | 41,988,990 | 25,907,905 | 44,760,119 | 48,509,197 | - 2,771,129 | + * |
| Norfolk & Western..... | 54,476,712 | 39,364,422 | + 38 | 87,716,135 | 60,814,836 | 40,962,872 | 28,513,261 | 46,753,263 | 32,301,575 | + 45 |
| Northern Pacific..... | 36,256,042 | 17,996,447 | +101 | 74,016,525 | 43,918,623 | 27,450,604 | 15,172,006 | 46,555,921 | 28,746,617 | + 62 |
| Pennsylvania..... | 149,444,806 | 86,700,104 | + 72 | 265,786,196 | 180,993,915 | 152,402,528 | 105,366,976 | 113,383,668 | 75,626,939 | + 50 |
| Pere Marquette..... | 13,207,921 | 6,880,233 | + 92 | 22,291,302 | 13,661,357 | 12,879,525 | 7,693,574 | 9,411,777 | 5,967,783 | + 58 |
| Pittsburgh & Lake Erie..... | 12,004,200 | 7,549,528 | + 59 | 18,011,252 | 11,812,496 | 8,046,180 | 9,176,177 | 9,965,072 | 2,636,319 | + 278 |
| Reading..... | 19,313,349 | 13,548,417 | + 43 | 38,233,405 | 23,002,689 | 25,667,917 | 17,366,177 | 12,565,488 | 5,636,512 | + 123 |
| St. Louis-San Francisco..... | 42,209,366 | 16,261,539 | +160 | 56,962,510 | 24,574,396 | 17,581,760 | 6,384,716 | 39,380,750 | 18,189,670 | + 117 |
| St. Louis Southwestern..... | 22,605,117 | 2,882,962 | +684 | 31,751,239 | 9,758,660 | 10,436,298 | 8,726,609 | 21,314,941 | 1,032,051 | + 1,965 |
| Seaboard Air Line..... | 42,752,136 | 8,139,827 | +425 | 62,890,799 | 18,450,213 | 21,047,608 | 8,340,393 | 41,843,181 | 10,109,830 | + 314 |
| Southern..... | 66,362,792 | 15,137,662 | +338 | 101,444,920 | 44,760,245 | 52,834,906 | 26,941,339 | 48,610,014 | 17,818,906 | + 173 |
| Southern Pacific..... | 124,603,269 | 29,954,259 | +316 | 221,704,777 | 70,531,073 | 128,164,476 | 42,176,425 | 93,540,301 | 28,354,648 | + 230 |
| Texas & Pacific..... | 22,378,796 | 3,748,877 | +497 | 34,032,347 | 11,926,546 | 14,548,126 | 5,327,044 | 19,484,221 | 6,594,502 | + 195 |
| Union Pacific..... | 219,580,736 | 43,109,403 | +409 | 289,439,699 | 86,282,041 | 102,288,273 | 39,549,655 | 187,151,426 | 46,732,386 | + 300 |
| Wabash..... | 28,560,140 | 13,836,782 | +106 | 39,858,710 | 21,526,525 | 24,325,394 | 6,394,111 | 15,533,316 | 15,132,414 | + 3 |

* Current liabilities exceeded current assets in 1946.

+ Current liabilities exceeded current assets in 1941.



under a regime of economic freedom, people will not exert the managerial effort and make the savings and investment necessary to enlarge and improve transportation service, if the rewards for such behavior are conspicuously less attractive than alternative ways of investing time and money.

The volume of freight traffic on the American railroads in the five years prior to World War II (1937-41) totaled only 24 per cent greater than a quarter-century earlier in the five years preceding World War I. But the average annual freight traffic during World War II exceeded that of World War I by 75 per cent—indicating that the period of the 'thirties affords no criterion whatever of the productive capacity of the American people, once they are provided with a real incentive to produce. Nor must it be forgotten that the World War I production records were established with 10,000,000 of the country's youngest and potentially most vigorous producers withdrawn for service in the military forces.

War Traffic May Be Exceeded

Within five years after the end of World War I, under a political regime favorable to free enterprise, national production so increased that the railroads had a larger freight traffic than they did at the height of the war in 1918.

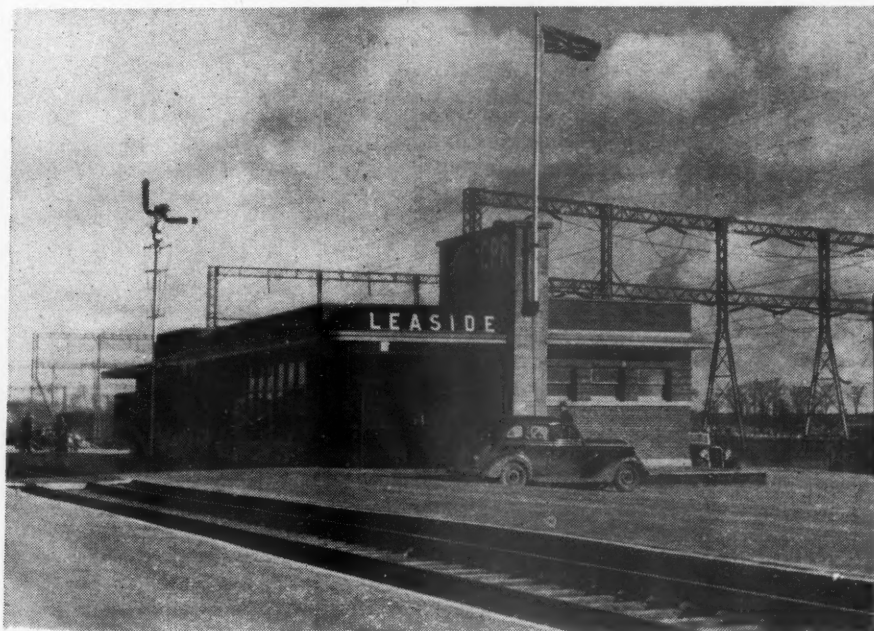
There is no reason whatever why history should not repeat itself and why

railroad traffic should not, this time also, very quickly recover and surpass the volume of 1944—unless the people deliberately prefer, by placing political impediments in the way of business initiative, to lapse back into the slough of poverty and chronic unemployment in which they reposed during the 'thirties. The results of the recent elections and the manifest vigor now at last being

evidenced by such industrial organizations as the National Association of Manufacturers do not point to any very early revival of the conditions of the 'thirties.

If, however, the railroads are going to have a peace-time traffic going upward from the peak of that achieved during the war, i.e., 737 billion ton-miles, then present railway plant will prove far from adequate to perform any such volume of transportation efficiently. Let it not be forgotten that in the decade ended 1941, on the eve of World War II, the railroads' net investment in road and equipment had not only not grown but had shrunk by a half-billion dollars. To get back on an upward trend line of national production and progress, the railroads have a much bigger job to do than that merely of matching current growth in business with proportionate additions and improvement to railroad plant; they have, besides to make up for an entire decade when their plant did not expand at all.

The figures presented in this discussion indicate that the railroads have the resources with which to *initiate* the improvements necessary to put them back on the trend line of national production, where they must remain if a shortage of transportation is not to be an obstacle to national progress and a menace to national defense. For them to have reasonable assurance of being able to continue for the long pull to keep pace with the demand for their services, a number of complex problems still remain for solution. These problems are discussed in the article reviewing railway finances, which appears further along in this issue.



C. P. R. Photo

While equipment issues are easily sold, fixed plant improvements are harder to finance—Only the sale of stocks or bonds or reinvestment of earnings can supply funds for this purpose

A Year of Labor Turmoil and Wage Boosts

Complex negotiations and the first nation-wide strike since 1922 cut labor's prestige but brought top pay in history—both actual and in terms of buying power

LABOR matters deserve a top-billing in a history of 1946. The year brought heavy new wage burdens to the railroads; the first nation-wide strike since 1922—following rejection by two unions of awards paralleling those of the first arbitration panels ever to be set up under the Railway Labor Act to adjudicate a nation-wide dispute; reorganization of the most troubled division of the National Railroad Adjustment Board; and the back-breaking Crosser Act, which adds to the Railroad Retirement Act further special privileges for railroad employees and further burdens for the companies.

Earnings at New High

As a result of the pyramiding of an 18½-cents-an-hour increase, (16 cents effective retroactive to January 1, and 2.5 cents effective May 22) on top of successive war-time wage boosts, both

By **W. H. SCHMIDT, JR.**
Assistant Western Editor
and **CHARLES ROBINSON**
Associate Editor

hourly and weekly average earnings of unsalaried railroad employees reached a new high in June, the latest month for which complete computations are available. As will be seen from Table I, average hourly earnings in that month were 19.4 cents, or 19.8 per cent, higher than for March (for which revised figures reflecting the retroactive wage boost are not yet available).

Contrary to labor organization contentions that employees must receive higher hourly pay because they are working fewer hours, the facts are that the average hours each employee actually worked in a week fell only slightly during the portion of 1946 for which

Actual weekly earnings of railroad workers in the summer of 1946 were very nearly double the 1923 figure, and their real earnings, adjusted for cost of living changes, were almost 82 per cent greater, yet agitation for additional costly concessions to union demands reached a climax in a nation-wide two-day strike.

statistics are available. In June, for example, average hours per week were 49.7, or but 2.6 below the annual average for 1945; only 0.6 hours shorter than September, 1945, the first month after the war; and 3 hours below the average for 1944, the all-time peak year in both ton- and passenger-miles. As a consequence, the wage increase granted this year more than offset any reduction incurred in service hours, and average weekly earnings in June (\$58.30) were almost \$10 more than the March average, and were \$6.84, or 13 per cent, higher than the average for 1944, the year of peak traffic and maximum service hours.

June was the peak month in weekly earnings for all three major wage-earning groups on the roads—skilled shop labor, unskilled workers, and train and engine service men—the average being \$62.91 for the first, \$40.16 for the second, and \$76.74 for the last.



Computations show that, while increases in the cost of living have somewhat neutralized the benefits of these new higher wages, railroad employees are "living high" in comparison with earlier years. Table I shows that in June they earned, in cold dollars and cents, for each hour they worked, over 100 per cent more than they did in 1923. If their earnings be adjusted to reflect changes in the consumers' price index as compared with 1923 (computed by the National Industrial Conference Board on the basis of the comparative retail prices of all important commodities and services entering into the living expense of the families of urban wage earners, and hence overstating the rise in living costs of railroaders in rural areas) it is found that they earned enough per hour in June, 1946, to buy more than 85 per cent more goods and services than in 1923. Taking the relative number of hours of employment into account, the increase in real earnings of employees is only slightly less striking. The actual weekly earnings of railroaders in June, 1946, were 96.6 per cent greater than in 1923, and the adjusted "real" earnings almost 82 per cent greater.

The war and the adjustment period following brought railroad employees unprecedented prosperity, both in actual dollar income per hour of employment and in terms of goods and services. Taking 1939 as a typical pre-war year for basis of comparison, the record shows that railroad employees earned 57 per cent more in actual dollars an hour, and 70 per cent more in actual dollars a week in June, 1946, than in the average month of 1939, the greater increment in weekly average arising from the longer average work-week in June,

1946. If the weekly averages are adjusted in terms of the Conference Board's price index (1923=100), the war-time increase in actual living standards of railroad employees is found to lie at about 35 per cent.

It is interesting to note how little railroad employees were affected by the "hold-the-line" wage policy enunciated for the general run of wage and salary earners and continued by the Presidential "cost-of-living formula" set forth in Executive Order 9697 (effective February 14, 1946). While the latter allows a maximum increase in wage rates of 33 per cent since the base date of January, 1941, the actual weekly earnings of all wage earners on the railroads have risen more than 60 per cent since that date, as the Conference Board points out. Almost 60 per cent of this increase in average earnings was gained by the labor organizations between January, 1941, and August, 1945, the last month of active warfare—in spite of wage stabilization schemes having over-all nation-wide application—partly by threats to strike on the eve of Pearl Harbor and in December, 1943, a crucial war month.

Level of Employment

A total of 1,381,977 employees were at work on the railroads in November, the latest month for which the I. C. C.'s mid-month count is available. This compares with 1,406,837 in November, 1945, and 1,407,556 in November, 1944, the peak traffic year. The record month for employment on the railroads since 1930 was August, 1944, when it reached 1,449,197. As compared therewith, employment in November, 1946 declined but 4.6 per cent.

Table II indicates the trend in railroad employment for each month, 1939 to 1946, inclusive, by index numbers based on 1935 to 1939 averages, and related to corresponding months of each year to cancel out normal seasonal variations. (For this reason the indexes do not compare exactly with the absolute comparisons given above). The 11-month index average for 1946—133.1—shows a decline of only 5.4 from the 12-month average of 138.5 for the record traffic year 1944, and a very substantial increase in employment compared with the 96.8 annual average for 1939, the last year prior to the defense period and the war.

"Productivity" Declines

A basic argument which doubtless will be used by unions in seeking to justify wage demands already blue-printed for 1947 is that employees' "productivity" is rising and must be recompensed. Table III sets forth the facts in the matter. It shows that in terms of operating revenue per employee and per dollar of wages and ton-miles of revenue freight per employee, "productivity" has declined substantially since the ratios attained in the record traffic year of 1944. Operating revenues per employee in the first half of 1946 declined 12 per cent from the average for the whole of 1945, and 18 per cent from 1944. Operating revenue per dollar of wages declined still further, due to wage boosts—17 per cent from 1945 and 22 per cent from 1944. The number of ton-miles produced by each employee in the first half of 1946 was 16 per cent less than in 1945, and 23 per cent less than in 1944.

The most spectacular event in the

Table I—Facts on Railroad Wages—1929-1946

Computed by National Industrial Conference Board from I. C. C. Statistics.
Price Index by N. I. C. B. based on quoted retail prices for goods and services.
(Class I railroads, excluding switching and terminal companies)

| Wage Earners Employed as of Middle of Month | | | | | | | | | |
|---|-----------------|-------------------------|-------------------|-------|---|-------------------------|--------|-------|---------------------------------|
| Number of Wage Earners | | Average Hourly Earnings | | | Average Actual Hours per Week per Wage Earner | Average Weekly Earnings | | | Consumers' Price Index 1923=100 |
| Period | Middle of Month | Actual | Indexes, 1923=100 | Real* | | Actual | Actual | Real* | |
| 1929 | 1,289,897 | \$.646 | 110.2 | 110.1 | 49.1 | \$31.71 | 106.9 | 106.8 | 100.1 |
| 1930 | 1,141,091 | .637 | 112.1 | 115.9 | 46.9 | 30.76 | 103.7 | 107.2 | 96.7 |
| 1931 | 959,242 | .667 | 113.8 | 130.5 | 44.1 | 29.41 | 99.2 | 113.8 | 87.2 |
| 1932 | 787,074 | .615 | 104.9 | 134.7 | 41.4 | 25.47 | 85.9 | 110.3 | 77.9 |
| 1933 | 727,245 | .615 | 104.9 | 140.1 | 41.6 | 25.56 | 86.2 | 115.1 | 74.9 |
| 1934 | 759,884 | .623 | 106.3 | 133.9 | 42.9 | 26.71 | 90.1 | 113.5 | 79.4 |
| 1935 | 748,139 | .674 | 115.0 | 139.9 | 43.7 | 29.46 | 99.3 | 120.8 | 82.2 |
| 1936 | 811,064 | .683 | 116.6 | 138.6 | 45.8 | 31.29 | 105.5 | 125.4 | 84.1 |
| 1937 | 847,309 | .704 | 120.1 | 136.8 | 45.8 | 32.23 | 108.7 | 123.8 | 87.8 |
| 1938 | 698,856 | .744 | 127.0 | 148.2 | 44.9 | 33.43 | 112.7 | 131.5 | 85.7 |
| 1939 | 742,920 | .747 | 127.5 | 150.9 | 45.8 | 34.23 | 115.4 | 136.6 | 84.5 |
| 1940 | 776,823 | .752 | 128.3 | 150.4 | 46.3 | 34.82 | 117.4 | 137.6 | 85.3 |
| 1941 | 871,437 | .764 | 130.4 | 146.5 | 48.2 | 36.83 | 124.2 | 139.6 | 89.0 |
| 1942 | 977,961 | .862 | 147.1 | 150.6 | 50.1 | 43.18 | 145.6 | 149.0 | 97.7 |
| 1943 | 1,037,352 | .875 | 149.4 | 144.9 | 52.5 | 45.97 | 155.0 | 150.4 | 103.1 |
| 1944 | 1,079,248 | .977 | 166.7 | 159.4 | 52.7 | 51.46 | 173.5 | 165.9 | 104.6 |
| 1945 | 1,081,129 | .983 | 167.7 | 157.8 | 52.3 | 51.40 | 173.3 | 163.0 | 106.3 |
| 1946 | | | | | | | | | |
| January | 1,055,464 | .983 | 167.7 | 156.6 | 50.4 | 49.60 | 167.2 | 156.1 | .. |
| February | 1,032,131 | .991 | 169.1 | 158.5 | 50.3 | 49.81 | 167.9 | 157.4 | .. |
| March | 1,033,378 | .980 | 167.2 | 156.7 | 49.6 | 48.60 | 163.9 | 153.6 | 106.7 |
| April | 1,012,164 | 1.093 | 186.5 | 174.0 | 49.5 | 54.05 | 182.2 | 170.0 | .. |
| May | 977,749 | 1.117 | 190.6 | 177.0 | 47.3 | 52.83 | 178.1 | 165.4 | .. |
| June | 1,000,129 | 1.174 | 200.3 | 185.1 | 49.7 | 58.30 | 196.6 | 181.7 | 108.2 |

*Actual earnings adjusted for changes in consumers' price index (final column) in terms of 1923 dollars.

1946 scene, of course, was the two-day strike of members of the Brotherhood of Railroad Trainmen and Brotherhood of Locomotive Engineers on May 23-25, the first nation-wide strike of railway employees since the shopmen's strike of 1922. But the numerous wage negotiations which preceded the strike were of equal importance. For the first time since the passage of the Railway Labor Act, the arbitration provisions of that act were used in a wage dispute of nation-wide scope.

As last year opened the railways were negotiating with the five major operating unions and the 15 allied non-operating organizations, which were asking a general wage increase of \$2.50 per basic day and some 50-odd changes in working rules for operating employees, and wage increases of 30 cents an hour for non-operating men. On January 27 the representatives of the Order of Railway Conductors, the Brotherhood of Locomotive Firemen & Enginemen, and the Switchmen's Union of North America, agreed to defer further consideration of their rules demands and to arbitrate their wage dispute. On the same date the representatives of the 15 co-operating non-operating unions also agreed to arbitrate their wage demands.

Arbitration proceedings began in Chicago on February 18, and were concluded on March 26. Eight days later the boards filed their reports, awarding the operating employees a wage increase of \$1.28 a basic day, and awarding the non-operating men an increase of 16 cents an hour, both retroactive to January 1, 1946. The railroads estimated the cost of these awards at \$619 million annually (including payroll tax increases of \$35 million). I.C.C. statisticians placed the cost of the arbitration awards at \$658 million annually, based on 1945 employment.

Although the awards were not satisfactory to either group of unions, only the non-operating group filed new demands for 14 cents an hour, the unsatisfied portion of the original request. These demands were served on the carriers on April 15. The three operating unions were no better satisfied than the 15 non-ops, but they filed no new demands pending settlement of the de-

mands of the trainmen and enginemen then being heard by an emergency board. The three operating unions did, however, ask that the carriers reopen the rules portion of their case, which they and the railways had agreed to defer until disposition of the wage case had been made. Final disposition for 1946 of the unsatisfied demands of all of the unions which were participants in the two arbitrated cases was made as an adjunct to the settlement of the May strike of the trainmen and enginemen.

Just prior to the January 26 arbitration agreements the leaders of the B. of R. T. and of the B. of L. E. broke off wage negotiations with the Carriers Conference Committee for the announced purpose of taking a strike vote. They had asked the same wage increases and virtually the same rules changes as the other three operating unions, but were unwilling to separate the wage issue from that of rules changes. Likewise, they did not appear to be willing to commit themselves to arbitration.

Following their January withdrawal from further direct negotiations with the carriers, the two unions proceeded with their plans for taking a strike vote, and on March 6 announced that the members of their organizations would walk out on March 11. In the meantime, the National Mediation Board, on February 11, attempted to mediate the dispute as required by the Railway Labor Act, but did not achieve success, as the representatives of the two unions failed to appear. Following the announcement by the unions of their intended strike, the Mediation Board turned the dispute over to President Truman for the appointment of an emergency board which was created on March 8. Hearings opened in Chicago on March 12, the strike having been postponed as required by law.

At the outset, it was evident that both the railways and the unions regarded the proposed rules changes fully as important as the wage increases sought. The total cost of the unions' demands were put by attorneys for the carriers at about \$1.5 billion annually, of which about \$785 billion, it was estimated, would result from the rules changes.

When the wage and rules case was presented to the emergency board the carriers asked for additional time on the grounds that, in reality, two issues were involved, i. e., one of wages and another of rules. They also contended that the rules issue was so complex that the 30-day period allowed by the Railway Labor Act for investigation and report was insufficient for adequate consideration of the rules case alone. The two unions opposed the move and the board held that under the law it could not compel them to agree to an extension of time.

In its report to the President, which was given on April 18, the board recommended a wage increase of \$1.28 per basic day and minor rules changes. The report termed the rules proposals of the disputants "extreme" and said that it considered them as being made far-reaching "for trading purposes." The report also stated that the rules issues were so complex and the evidence so voluminous that a reasonable result could be achieved only after months of study and only by the cooperative assistance of the parties. In this respect the board appears to have upheld the railways' point that additional time should have been allowed to study the rules issue.

After a few days' consideration, the railways accepted the report of the board, including the rules recommendations. The two unions, however, on May 3 announced they had been unable to reach an agreement with the carriers and that they would not accept the findings of the emergency board. Instead, they called a strike for May 18, to enforce their demands.

In the meantime, the three operating unions which had arbitrated their wage demands filed new wage demands asking an increase of 40 cents in basic daily wage rates applicable to road service and \$1.20 in basic daily rates applicable to yard and hostling service. In addition, they asked for the establishment of daily minimum earnings, and for proportionate changes in pay for arbitraries.

On May 17, President Truman, by executive order, took over the operation of the railroads, naming Charles H. Buford, executive vice-president of the Chicago, Milwaukee, St. Paul & Pacific, as federal manager, and on the following day, less than five minutes before the strike was scheduled to go into effect, the two brotherhoods involved postponed the walkout for five days to give the President an opportunity to work out a compromise proposal.

During the five-day recess period the President proposed a wage increase of 18½ cents an hour and a withdrawal of the rules demands for one year. This proposal was immediately accepted by

Table II—I. C. C. Index of Railway Employment

(Class I railways, excluding switching and terminal companies)
Ratio to Corresponding Month of 1935-1939

| Month | 1939 | 1940 | 1941 | 1942 | 1943 | 1944 | 1945 | 1946 |
|------------|-------|-------|-------|-------|-------|-------|-------|--------|
| Jan. | 95.2 | 101.1 | 104.0 | 119.0 | 134.4 | 138.3 | 142.0 | 142.0 |
| Feb. | 95.9 | 101.3 | 104.9 | 117.3 | 132.0 | 139.3 | 142.0 | 137.3 |
| Mar. | 95.6 | 99.5 | 106.1 | 119.6 | 133.2 | 140.6 | 143.0 | 137.5 |
| Apr. | 93.9 | 97.3 | 106.9 | 123.6 | 134.1 | 140.6 | 141.4 | 134.0 |
| May | 92.7 | 98.1 | 109.0 | 125.0 | 132.9 | 140.2 | 140.4 | 128.6 |
| June | 95.3 | 99.3 | 110.8 | 125.0 | 133.7 | 139.9 | 140.6 | 128.6 |
| July | 95.7 | 100.4 | 113.5 | 126.3 | 133.5 | 138.4 | 139.2 | 129.5 |
| Aug. | 96.1 | 101.4 | 115.4 | 126.9 | 132.4 | 139.1 | 139.0 | 131.6 |
| Sept. | 98.1 | 102.6 | 116.4 | 126.5 | 131.3 | 136.3 | 135.0 | 130.3* |
| Oct. | 100.6 | 102.3 | 116.2 | 125.3 | 129.6 | 133.7 | 132.4 | 130.4* |
| Nov. | 101.1 | 101.6 | 117.0 | 127.0 | 132.2 | 136.7 | 136.6 | 134.2* |
| Dec. | 101.4 | 103.1 | 119.2 | 131.6 | 134.3 | 139.4 | 139.1 | .... |

* Preliminary data.

the carriers but was rejected by the unions, who struck on May 23. Two days later the strike was ended under the terms of the President's compromise proposal. The unions had gained nothing for their men they had not already won, except the loss of two days' pay and a rich harvest of public disfavor.

There are many who feel that the action of the President during the strike forced the settlement. Mr. Truman's proposal for an increase of 18½ cents an hour in lieu of all other demands had been accepted by both the carriers and the three operating and 15 non-operating unions that had previously arbitrated their differences. (It must be emphasized that these 18 unions had not threatened any strike action whatsoever and were bargaining with the carriers in the manner prescribed by the Railway Labor Act. The strike action was entirely the work of the B. of R. T. and the B. of L. E. The members of the other 18 organizations, as a result of the strike settlement, gained an additional wage increase of 2½ cents an hour, but, in turn, lost any further consideration of all of their demands for a period of one year).

When the government took over the roads, the President directed Federal Manager Buford to recruit the necessary employees to man the trains, although such action was not taken during the brief strike. In a radio address on May 24, the President told the two unions that, unless the trains were running by 4 p.m. on May 25, he would use troops to see that they were run. A few minutes before 4 p.m., as the President was preparing to address Congress to ask for emergency legislation to deal with the situation, the strike was called off, and by the following day most railroad operations were normal. The roads were returned to their owners on May 26, at 4 p.m.

Certainly the striking employees did not benefit from the strike, as they could have obtained what they eventually won without a strike. The carriers lost much revenue and the public suffered untold inconvenience. Some helpful legislation was later passed by Congress, but the recent nation-wide coal strike indicates that the government still lacks adequate machinery to deal with labor disputes in basic industries. For a short time the railways gained public appreciation of the nation's almost complete dependence on rail transportation for its very existence, yet the Interstate Commerce Commission saw fit to dawdle for seemingly endless months with their application for desperately-needed increased freight rates.

Although the President's action of last May temporarily settled the major railways' labor dispute of the year, many short lines felt they were not bound by the settlement because, although strike

notices had been served on them, they had not otherwise been approached by the unions for wage negotiations. A majority of the short lines adopted the settlement made effective by the larger roads, but 23 held out and, on October 25, the President appointed an emergency board to consider the matter. This board recommended that the 18½ cents per hour increase be effected by some of these roads, and proposed specific wage adjustments for others.

Adjustment Board Reorganized

During the year, the carrier portion of Division One of the National Railroad Adjustment Board was reorganized. It began functioning in September, after more than a year of inactivity resulting from a decision of the United States Supreme Court in *Elgin, Joliet & Eastern vs. Burley*, which held that employees may bring individual claims against a carrier after an award has been made by the Adjustment Board (*Railway Age*, June 16, 1945, page 1072). A change in the method of filing cases by the unions to comply with the opinion of the Supreme Court, while at the same time permitting final decisions of the board, enabled resumption of deliberations.

When this occurred the board was faced with a backlog of 2,845 separate cases, of which 1,815 had not been heard, while the others only awaited a decision. As of December 14, this number had been reduced to 2,489 cases on the docket, of which all but 935 had been heard. Aiding the board in the disposition of cases has been a strong tendency to withdraw large numbers for further discussion "on the property."

Crosser Bill

Although the wage settlement relieved the carriers of prospects of a further increase in direct wage costs for at least a year, the unions secured, through legislation, a substantial gain in the Crosser Bill, which greatly increases railway pension plan coverages, and along with it, payroll taxes. Passage of the Crosser Bill occurred on July 13, despite an adverse report on the bill in its final form by the House committee on interstate and foreign commerce.

The bill, which became effective January 1, 1947, liberalizes the survivor annuity provisions of the previous law, makes employees eligible for disability pensions after 10 years of service, reduces from 65 to 60 the age at which women employees may retire on a full pension, adds sickness and maternity benefits, and increases unemployment benefits from \$4 to \$5 a day, while extending the maximum duration of such benefits from 100 days to 130 days in any one year.

Table III—"Productivity" of Railroad Employees—1940-1946

| Year | I.C.C. statistics (Class I roads, excluding switching and terminal) | | Ton-mi. Rev. per employee |
|------|---|----------------------------|---------------------------|
| | Operating Rev. per employee | Oper. Rev. per \$ of wages | |
| 1940 | \$4,184 | \$2.19 | 363,000 |
| 1941 | 4,691 | 2.29 | 417,000 |
| 1942 | 5,874 | 2.55 | 502,000 |
| 1943 | 6,682 | 2.57 | 537,000 |
| 1944 | 6,675 | 2.45 | 521,000 |
| 1945 | 6,268 | 2.31 | 479,000 |
| 1946 | 5,504* | 1.92 | 403,000† |

* Estimated on basis first 6 months' revenue X 2.

† Estimated on basis first 6 months' traffic X 2.

To pay for these changes, earnings up to \$300 a year are taxed a total of 11½ per cent of the total payroll, advancing to 12½ per cent by December 31, 1951—these taxes to be paid half each by employees and by employers. In addition, the carriers are to continue to pay a 3 per cent unemployment insurance tax.

What of the Future?

In spite of the recent pronounced vote trend toward the "right" and "government-hands-off," what the labor organizations will do in 1947 is fairly obvious. The Railway Labor Executives Association already has set forth an ambitious program for the near future in an elaborate report entitled "Labor and Transportation" (see *Railway Age* for November 30, 1946, page 922). Among their immediate objectives are the following changes in rules and rates of pay, which may cost the carriers dearly:

- (1) Time-and-a-half for overtime after 40 hours a week and, maybe, double time for Sunday work.
- (2) Shift differentials—i.e., extra pay for work on the second and/or third trick.
- (3) "Adequate" reimbursement for time-away-from-home.
- (4) Comprehensive programs for medical care, life insurance and other "benefits," to be supported by the industry.
- (5) Extended "minimum manning" rules.
- (6) "Realistic" (i.e., higher) entrance wages.
- (7) "Parity" between railroad and industrial wage (i.e., hourly) rates.
- (8) Widespread improvements in facilities.

For the long term, the unions intend to start conferences on the matter of a guaranteed annual wage, although the report is somewhat vague about this costly idea.

It is clear that, notwithstanding their party affiliation, a large number of legislators will pay obedient heed to the strong "political persuasion" machine which the brotherhoods have built up in virtually every congressional district in the country. Hence the old pressure will continue on railroad management to give in to the organizations' demands. It may also be expected that, having gotten Congress in the habit of prescribing, under the commerce clause, for practically everything in the railroad business, and

(Continued on page 67)

Work Equipment Purchases Down in 1946 But Need for Mechanization Grows

Unfavorable factors during year upset early predictions somewhat, but roadway and structures forces turn increasingly to power machines and tools to carry out their work more economically

By NEAL D. HOWARD
Western Editor

THE use of power machines and tools in the work of the roadway and structures departments of the railways gained a still firmer foothold in 1946, and in the widespread operations of these departments, where initial resistance to mechanization was possibly greater than in any other department, the prospects for still further mechanization, with all its attendant advantages, are unquestionably greater than in any other department. This is said despite the fact that in neither work equipment purchases nor the use of such equipment was 1946 as impressive as 1945, when the war conditions prevailing until V-J Day boomed purchases and saw maintenance programs reach heights restricted only by the inability to secure the necessary materials, labor and equipment to carry them out. Nevertheless, 1946 was another highly important year in the purchase and use of work equipment, with total purchases of power machines and tools higher than for any year on record prior to 1944, and approximately equal

During 1946, approximately 9,950 units of power machines and tools were purchased by the railways for the further mechanization of maintenance of way and structures operations at a cost of approximately \$15.5 million. Large as these purchases were in number, they were somewhat less than war-time peaks and were restricted considerably by conditions which held down railway earnings and delayed deliveries from manufacturers. However, the need for overcoming deferred maintenance and for higher standards of upkeep generally, plus the increased necessity for maximum economy, promise to produce a substantial demand for work equipment units in 1947.

to those in 1944. Furthermore, maintenance officers, from their war experience, if not earlier experience of the depression years, became more convinced in 1946

than ever before that only through the most effective and complete mechanization of their operations can the large programs of maintenance work necessary be carried out with the greatest economy.

That the past year was not as intensive as 1945 in either equipment purchases or work programs was contrary to the expectations of most maintenance officers early in the year, who, in spite of the enlarged work programs they had carried out during the war, saw their tracks and other structures in need of heavy repairs and anticipated an early start in recouping these war-time losses. At the outset of the year, a continued labor shortage for at least the first six months was anticipated, calling for large additional purchases of work equipment and power tools, and for their use on as large a scale as possible. The war was over and some discharged service men were returning to the roads, with the prospects of more, but the bulk of the Mexican labor brought into the country for work on the railroads was being rapidly returned to Mexico, and there was a growing reluctance on the part of many former employees released from military service to return to their old jobs, and a widespread refusal on the part of those released from war plants to return to jobs that paid less money than they had secured for war work.

Economy Becomes Paramount

Faced with these prospects, maintenance officers at the start of the year were again looking to their work equipment and to still further mechanization of operations as the only solution to their problems, and the annual budgets of many roads at that time indicated purchases of equipment during the year on a scale only little below the high level of purchases during 1945. But with the rapid closing of war plants and demobilization of the military forces, the feared continued labor shortage was to be short-lived, except in certain areas. Work equipment to supplement insufficient forces, as such, to get essential work



Rail-laying equipment, such as these adzers, was again in considerable demand during 1946

done, was not to assume the same importance as during the war, but almost simultaneously with this change, the original and primary justification for the purchase and use of such equipment by the maintenance forces—economy—returned with a vengeance.

It is true that increased production, improved quality of work, and a desire to minimize the arduous character of many operations, continued to be important factors, but increased labor costs—the results of further wage increases granted employees—plus the drastic reduction in railway earnings during the year as the result of strikes and the long-delayed action on the part of the Interstate Commerce Commission in granting the roads an increase in freight rates, became the dominant factors calling for the more intensive and diversified use of power machines and tools in carrying out maintenance operations.

But these same factors — increased costs and reduced earnings—which necessarily called for some cut-back in the originally planned programs of work during 1946, at the same time had the effect of lessening the urgency for adding to at least some categories of equipment already on hand, and for the planned intensive use of most types of equipment generally. In fact, on some roads, there were times during the year when all but the most essential types of maintenance work were severely restricted, as during the second coal strike of the year, which automatically put much work equipment on the shelf for the time being. These work stoppages, necessary as they may have been, were serious obstacles to the completion of highly essential work, and especially the November-December slow-down, which came at a time when the need for closing up already curtailed programs, to get the

fixed properties in shape for the winter, was of the greatest consequence. Still other factors tending to reduce the size of maintenance programs during 1946 were shortages in materials, notably rail and track fastenings, which curtailed many large-scale rail-laying programs and upset the most effective use of much rail-laying equipment; and in lumber, timber, and structural steel, which held back even normal programs of bridge, trestle and building repairs.

Programs and Purchases Cut

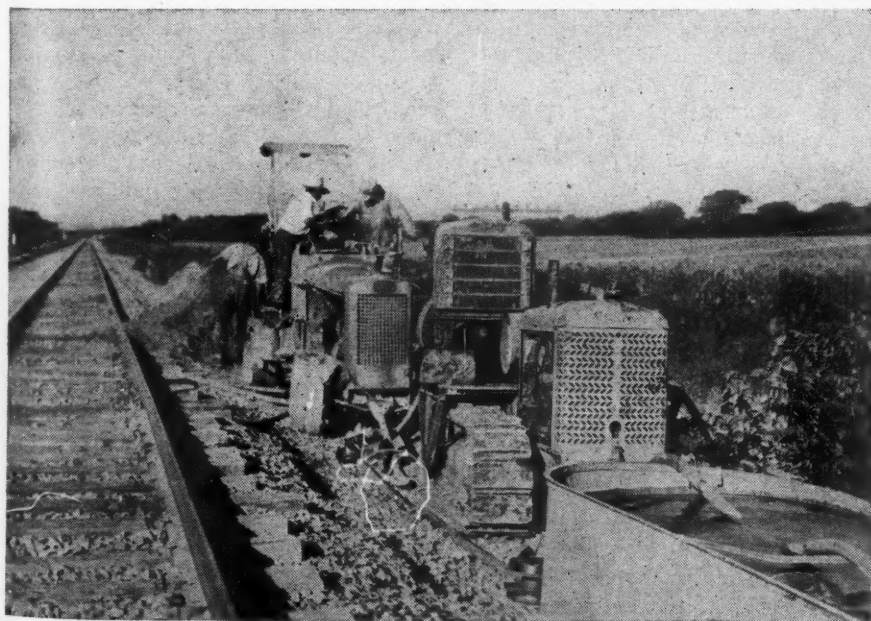
All of these factors were widely disrupting to the plans of the maintenance forces set up early in the year for overcoming some of their war losses, and for making at least a start on their programs to raise the standards of the fixed properties generally as a part of the post-

war plans of the railroads for improved passenger and freight service. Based upon information furnished to *Railway Age* early in the year by a number of the larger roads of the United States and Canada, it was confidently expected that the roads of these two countries as a whole would carry out much larger programs of construction and maintenance than actually developed. Although there was much hedging in the estimates given, it was expected, for example, that the roads would spend approximately \$1,580,000,000 during the year for improvements and upkeep of their fixed properties, whereas it is now estimated, on the basis of the latest figures available, that they spent \$1,400,000,000 for these purposes.

Likewise, while it was not anticipated that work equipment purchases in 1946 would reach the all-time high of 1945,



Left: Much new and varied equipment is being used in roadbed stabilization by grouting. Above: A wide variety of power tools and machines are essential to efficient bridge and building work



it was expected they would be substantial, as they actually proved to be, although they were not as high as they would have been under more favorable industrial and economic conditions.

According to recent figures furnished to *Railway Age* by all but two of the more important roads of the United States and Canada, these roads purchased 9,950 units of power tools and machines of all kinds during 1946, at an estimated cost of approximately \$15,400,000. Small as these purchases were compared with those in 1945, when the roads purchased 12,000 units at an estimated cost of \$17,500,000, it is significant



Off-track grading equipment is finding a constantly increasing place in the maintenance of roadway

that they were larger than in any previous year, except 1944, when the roads purchased 9,984 units at a total cost of approximately \$14,400,000. Earlier annual purchases of record, beginning in 1937, were as follows: 1937—3,310 units, \$5,000,000; 1938—1,376 units, \$2,000,000; 1939—3,547 units, \$6,000,000; 1940—5,414 units, \$7,250,000; 1941—8,007 units, \$10,500,000; 1942—7,612 units, \$10,270,000; and 1943—8,507 units, \$12,300,000.

As in the past, 1946 purchases covered a wide range of types and models, including several entirely new and improved types, and a number of the larger machines, such as cranes, pile drivers, ballast cleaners, etc., which for various reasons were exceedingly difficult to secure during the war. Likewise, the purchases reflected in large measure the determination of the roads to continue large programs of reballasting and resurfacing to pull their tracks "out of the mud" after the severe pounding they received under war traffic; increased interest in stabilizing slides and soft spots in track by grouting and other methods; and a continuing trend toward the use of off-track equipment to minimize the interference of work operations with traffic, and conversely, the interruption of work operations by traffic.

Shortages Delay Deliveries

That the railroads did not purchase more power tools and machines for their roadway and structures forces in 1946 was to a considerable extent also for reasons beyond those already mentioned as prevailing on the railroads themselves, and entirely beyond their control. One of the most important of these was one which prevailed so generally throughout the war—shortages in certain of the materials entering into the construction of

such equipment, and the consequent inability of the builders to make deliveries with any degree of promptness or certainty. To mention only a few of these materials, steels of various grades, gray and malleable iron castings, lead, copper, and lumber, were in short supply almost throughout the year, and in most cases grew increasingly short as the year progressed. Furthermore, labor unrest and strikes in the plants of certain builders or in the plants of their suppliers, added to restricted production, and road after road refused to place orders with companies that could give no assurance of reasonable delivery. Even in the case of much of the equipment that was purchased, deliveries took as long as eight to ten months, and to a considerable extent deliveries of replacement parts, of which there were large orders, were little more prompt.

Thus, contrary to expectations and hopes early in the year, and in spite of the large volume of maintenance work that was actually carried out, the roads did not get in 1946 all they expected in work equipment—did not get done all they had hoped for in many classes of maintenance—and to the extent that they failed in both of these respects, face enlarged programs of work and increased needs for equipment in the year immediately ahead.

Every aspect of the future of the railroads calls for the maximum use of power tools and machines in maintenance of way and structures work. One of these is the huge volume of work that must be done to put the tracks and other structures back into shape, and to maintain them to the high standards that will be required to meet effectively air line and highway competition through increased comfort, greater speed, shortened overall schedules, and still further in-

creased safety. Especially important is the maximum economy that will be required in carrying out all of this work to offset increased labor and material costs, while at the same time making it possible for the railways to attract the largest volume of traffic through the lowest possible rates. Furthermore, only by a still further easing of the arduous character of many classes of maintenance of way and structures work through the use of power machines and tools can the railroads hope to attract and hold the class of labor necessary to a high standard of work and a high degree of efficiency.

Large Purchases Ahead

For all of these reasons the railroads will require continued annual purchases of several thousand track motor cars and other conveyances for transporting their forces quickly and conveniently to and from points of work, hundreds of units of track raising and surfacing equipment, hundreds of a wide variety of machines and tools for making rail replacements, and hundreds of machines and power tools for bridge and building work. In addition, they will require hundreds of units of work equipment and tools for a wide variety of miscellaneous operations, including ballast cleaning, weed control, snow fighting, ditching and drainage work, and such major operations as line changes, curve and grade reductions, tunnel daylighting, cut widening, right-of-way grading, and roadbed stabilization. On most roads, work of the latter types has been barely begun, and on many no such work has been undertaken. For example, during 1946, one large road undertook the first sizable line revision since it was built, although it operates in a territory where extensive projects of this character have

long been deserving of attention. Furthermore, in spite of the wide publicity that has been given to the more recently developed methods of roadbed stabilization, such work is still in its infancy; has not been undertaken at all on most roads; and cannot be undertaken on these roads until suitable equipment is purchased for the purpose.

As for cut widening and right-of-way grading to improve drainage, stabilize the roadbed, minimize snow difficulties, and reduce the cost of weed control—all in the interest of higher standards of track maintenance and reduced costs—the surface has barely been scratched, and work cannot be carried out on the

alone for work equipment replacements due to depleted service life and obsolescence.

Prospects Brighter for 1947

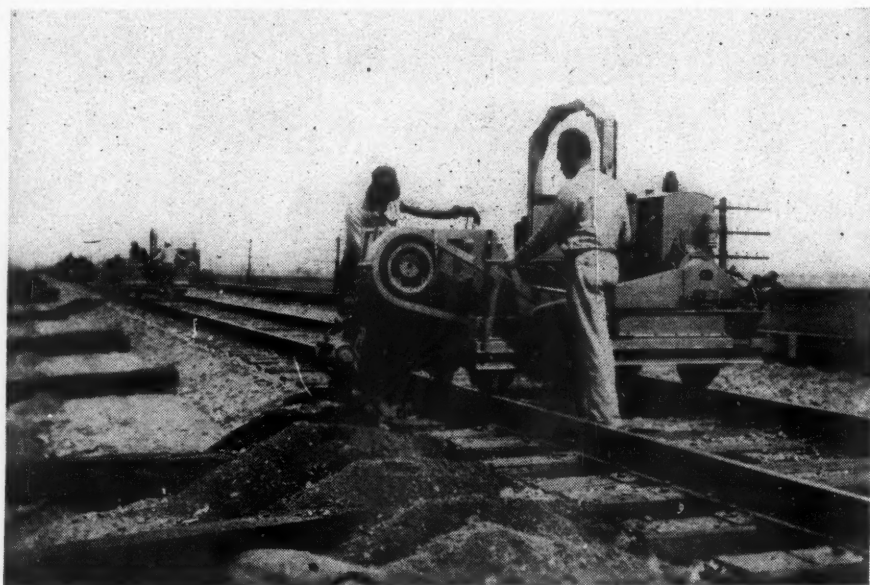
What is the outlook for equipment purchases in 1947? The answer to this question is bound up with so many uncertainties, including labor and material conditions, the general economic health of the country, and the earnings of the railroads, that even an intelligent guess is difficult. However, it is certain that all of the reasons that restricted work programs and equipment purchases in 1946, plus the increasing

need for higher standards of maintenance, greater productivity, and increased economy, have, in effect, augmented the need for large programs of work and large purchases of work equipment in 1947. Furthermore, the belated but sizable increase in freight rates allowed the railroads effective January 1, 1947, is certain to have a favorable effect on the ability of the roads to purchase needed equipment in 1947.

More "Equipment-Minded"

It is likewise certain that those in charge of roadway and structures work on the railways are more equipment-minded than at any time in the past; are more receptive to any and all types of equipment that will increase production and reduce costs; and are more conscious than ever before of the economic losses, often hidden, in the continued operation of worn-out and obsolete units.

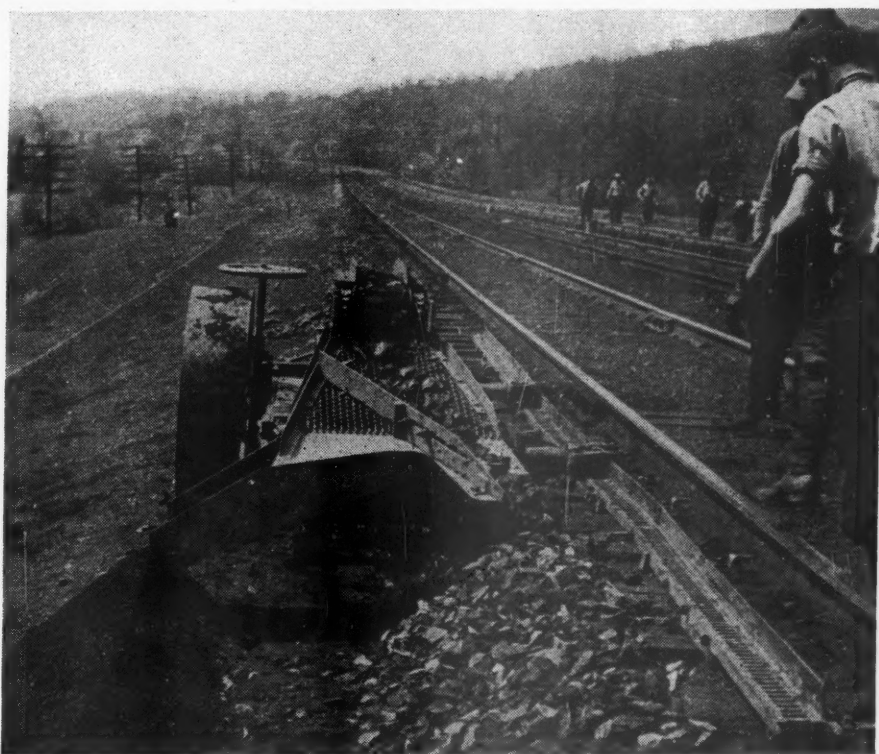
In the light of these facts, any real development of the post-war boom that has continued thus far to be "just around the corner" is certain to see an upturn in maintenance of way and structures operations, with a corresponding upturn in the purchases of power tools and machines to carry out these operations.



Above: The Cribex—one of the latest developments in machines for removing ballast from the tie cribs for cleaning or disposal

scale warranted without the purchase of many hundreds of units of modern earth-moving equipment.

Adding to the huge purchases of equipment that must be made to augment present equipment to carry out classes of work still practically untouched on many roads will be the large purchases that will be required for replacements—not only of those machines that have been worn out in service, but of those that have been rendered obsolete by new and improved types of greater capacity, utility or economy. An indication of the potential extent of these purchases annually on the roads of the country as a whole is the program of one road, with a main-track mileage of 2,300 miles, which calls for an annual expenditure of approximately \$190,000



Below: Ballast cleaning is scheduled for increased attention on many roads



Line-change projects are very much in the picture today. This view was taken on a relocated section of the Rock Island's main line between Perlee, Iowa, and Eldon

Maintenance Expenditures in Down Trend

Various factors combined to restrict activity somewhat in 1946—Improvement work went forward at moderate pace

By **MERWIN H. DICK**
Engineering Editor

AS far as the engineering and maintenance forces of the railroads are concerned the passing of the year 1946 will occasion little regret. While the railroads in general entered the year with ambitious programs of maintenance and construction—designed both to overcome the wear and tear of the war years and to continue the improvements so urgently needed in view of increased competition—the achievements in many categories of activity fell short of the objectives. This was due partly to the necessity of curtailing expenses because of spiraling costs without compensating increases in rates, and partly to continuing shortages of materials and even of labor. Entering 1947, the railroads have the need and the desire to perform

large amounts of maintenance and construction work, and their chances of doing so have been definitely enhanced by the increase in freight rates, effective January 1, although the events of the year will be determined partly by other factors that cannot be evaluated precisely at this time.

Still High, but Down

Considering first the overall activities of the maintenance of way and structures departments of the railroads in 1946, it is possible to state that, for the fourth consecutive year, the total expenditures of these departments exceeded a billion dollars, although the figure for 1946 was substantially below that for the previous

year. Based on official figures for the first nine months of the year, it is estimated that the total expenditures of the Class I railways for maintenance of way and structures work in 1946 amounted to approximately \$1,160,000,000. Considered at its face value, this figure represents a decrease of \$251,300,000, or about 17.8 per cent, compared with 1945, and a decrease of \$103,000,000 or 8.2 per cent, compared with 1944. However, when the expenditures for last year are compared with pre-war years they show up in an entirely different light, amounting to $2\frac{1}{2}$ times the expenditures for 1939 and $1\frac{1}{2}$ times the average annual expenditures for the period 1925-29, inclusive.

The annual expenditures of the Class I railroads for maintenance of way and structures for the 11 years ended with 1945, the latest year for which complete figures are available, as well as the average annual expenditures for the period 1925-29, are shown in one of the tables. Included also are figures showing the manner in which the total for each year was distributed among the various primary accounts.

The expenditures of the Class I railroads for maintenance of way and structures last year are estimated at \$1,160,000,000, which is somewhat lower than during the recent war years but far above the immediate pre-war years. This article endeavors to translate the dollar expenditures

for 1946 into terms of actual work accomplished, and gives estimates of the rail and tie renewals for that year. Accomplishments of the construction forces are also discussed, and the prospects for both maintenance and improvement work in 1947 are appraised.

Before the dollar value of the expenditures for 1946 can be used as an index of activity, relative especially to the years before the war, allowances must be made for a number of factors that have tended increasingly in recent years to create a disparity between the total charges for maintenance of way and structures and the actual amount of work accomplished. Prominent among these factors are the higher wage scales and the increased prices for materials that have become a part of the present-day economy. The importance of these developments is easily demonstrated by comparing present representative wages and prices with those that prevailed in 1939. According to figures compiled by the Interstate Commerce Commission, earnings of railroad section laborers in July, 1946, averaged 82 cents an hour, which is exactly twice the average hourly earnings for 1939. A similar increase occurred in the hourly earnings of extra gang laborers, while the hourly earnings of bridge and building carpenters, averaging \$1.07 in July, 1946, were 58 per cent greater than in 1939.

Prices Also Up

Substantial increases have occurred also in the prices the railroads must pay for the materials used by maintenance forces in repairing tracks and structures. The price of steel rails, for example, has gone up from \$40 a gross ton in 1939 to \$48.60 a ton in 1946, an increase of 21.5 per cent. The relative increase in the price of ties has been even greater. In 1939 the average cost of a new treated tie was \$1.28, whereas in 1946 the price had climbed to an average of about \$2.34, representing an increase of about 83 per cent. Aside from the higher wages and prices prevailing today there is another factor which, since 1943, has tended to inflate the total charges for maintenance. This is the substantially higher charges for depreciation of roadway property as compared to the practice in prior

years. For instance, in 1945, the latest for which figures are available, total expenditures included depreciation charges on roadway property of \$118,846,740, which compared with similar charges of only \$40,766,091 in 1942, the last year before the roads were required by the I. C. C. to set up mandatory systems of depreciation accounting for certain roadway property. On the other side of the ledger a number of factors should be mentioned that helped somewhat in 1946 to increase the effectiveness of the maintenance dollar, although the total effect of these influences was relatively minor. One of them was the universal tendency among railroad maintenance departments to dispense with the practice of doing considerable amounts of work at overtime rates of pay—a practice that became common during the war as a means

| Rail Applied in Renewals—Class I Roads | |
|--|------------|
| | Gross Tons |
| 1925 | 1,950,146 |
| 1926 | 2,209,873 |
| 1927 | 2,124,765 |
| 1928 | 2,080,277 |
| 1929 | 1,958,489 |
| 1930 | 1,517,002 |
| 1931 | 984,900 |
| 1932 | 394,536 |
| 1933 | 403,254 |
| 1934 | 631,093 |
| 1935 | 582,794 |
| 1936 | 921,298 |
| 1937 | 1,029,861 |
| 1938 | 599,752 |
| 1939 | 878,643 |
| 1940 | 998,914 |
| 1941 | 1,197,593 |
| 1942 | 1,192,225 |
| 1943 | 1,262,547 |
| 1944 | 1,561,638 |
| 1945 | 1,613,548 |
| 1946 | *1,218,000 |

* Estimated.

of attracting workers and, at the same time, of making the most effective use of the limited amount of labor available. Another factor tending to offset higher maintenance costs was a noticeable increase on some roads in man-power efficiency, this being attributable to the fact that certain classes of relatively inefficient labor that had been widely used during the war years largely disappeared from the scene in 1946. However, it appears that, in general, the

| Cross-ties Applied in Renewals—Class I Roads | |
|--|-------------|
| 1925 | 82,716,674 |
| 1926 | 80,745,509 |
| 1927 | 78,340,182 |
| 1928 | 77,370,491 |
| 1929 | 74,679,375 |
| 1930 | 63,353,828 |
| 1931 | 51,501,659 |
| 1932 | 39,190,473 |
| 1933 | 37,295,716 |
| 1934 | 43,306,205 |
| 1935 | 44,351,900 |
| 1936 | 47,361,015 |
| 1937 | 47,729,538 |
| 1938 | 41,363,224 |
| 1939 | 45,088,278 |
| 1940 | 43,620,653 |
| 1941 | 47,224,593 |
| 1942 | 48,616,228 |
| 1943 | 45,439,512 |
| 1944 | 48,032,634 |
| 1945 | 43,912,213 |
| 1946 | *37,000,000 |

* Estimated.

individual efficiency of maintenance workers is still somewhat short of that which prevailed prior to the war. A significant aspect of the performance of the maintenance forces in general in 1946 is that the maintenance ratio (maintenance expenses expressed as a percentage of operating revenues) climbed somewhat above the relatively narrow range in which it had fluctuated for many years. Specifically, the maintenance ratio for the first nine months of the year was 15.4, whereas the average figure for the 10 years ended with 1944 was 11.7, the maximum during this period being 13.4 in 1944 and the minimum 10.7 in 1942. (The ratio for 1945 is eliminated from consideration because it was influenced by certain abnormal charges that prevailed in that year.) The higher ratio for 1946 can be explained in large part by the fact that the increased wages and material costs that had to be paid could not be offset by higher charges for services rendered. However, the fact that the maintenance ratio last year was so far out of line with previous experience will have the effect of thrusting it into the spotlight and of emphasizing the necessity of seeking measures to increase the efficiency of maintenance activities. Notwithstanding the increase in the maintenance ratio, it is apparent from the downward trend of actual maintenance

Expenditures for Maintenance of Way and Structures, Class I Railways

| | Average 1925-1929 (Inclusive) | 1935 | 1936 | 1937 | 1938 | 1939 | 1940 | 1941 | 1942 | 1943 | 1944 | 1945 |
|-----------------------------|-------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|-------------|-------------|
| Superintendence | \$ 57,262 | \$ 35,605 | \$ 37,357 | \$ 39,801 | \$ 38,935 | \$ 39,072 | \$ 40,231 | \$ 43,407 | \$ 49,461 | \$ 57,592 | \$ 63,790 | \$ 65,590 |
| Roadway Maintenance | 83,698 | 35,809 | 38,289 | 42,017 | 37,219 | 36,112 | 38,372 | 47,923 | 69,701 | 110,764 | 121,072 | 118,453 |
| Tunnels | 2,608 | 1,453 | 1,326 | 1,709 | 1,256 | 1,210 | 1,374 | 1,780 | 4,529 | 3,668 | 4,222 | 3,734 |
| Bridges, Culverts, etc. | 43,471 | 22,646 | 24,032 | 26,268 | 24,200 | 24,782 | 26,514 | 31,754 | 40,801 | 44,356 | 51,227 | 48,540 |
| Ties | 114,859 | 51,936 | 56,315 | 59,799 | 53,762 | 59,910 | 58,353 | 64,928 | 75,141 | 84,982 | 100,446 | 96,314 |
| Rails | 47,402 | 16,302 | 21,192 | 20,412 | 17,406 | 22,065 | 22,736 | 24,684 | 25,199 | 33,146 | 39,544 | 42,831 |
| Other Track Materials | 48,354 | 20,959 | 26,732 | 30,228 | 22,817 | 29,670 | 33,428 | 38,711 | 40,091 | 50,541 | 57,220 | 60,955 |
| Ballast | 19,379 | 8,357 | 11,992 | 12,362 | 7,744 | 10,343 | 11,592 | 15,093 | 20,107 | 25,168 | 28,493 | 31,787 |
| Track Laying and Surfacing | 211,067 | 94,033 | 106,072 | 121,113 | 103,420 | 114,932 | 117,839 | 156,142 | 212,594 | 289,636 | 366,999 | 356,823 |
| Fences and Snow Sheds | 5,831 | 2,260 | 13,397 | 13,689 | 12,939 | 13,235 | 3,408 | 3,930 | 4,031 | 15,877 | 18,121 | 16,310 |
| Crossings and Signs | 13,115 | 7,186 | 41,252 | 47,757 | 34,315 | 41,018 | 46,852 | 60,412 | 80,663 | 102,680 | 114,513 | 117,714 |
| Buildings | 79,000 | 33,047 | 5,860 | 6,182 | 4,672 | 5,207 | 6,020 | 6,736 | 8,561 | 9,680 | 11,473 | 11,129 |
| Water Supply | 10,444 | 4,497 | 13,452 | 15,408 | 11,456 | 13,720 | 15,434 | 18,971 | 20,892 | 23,397 | 28,664 | 31,244 |
| Tools and Equipment | 18,230 | 11,044 | 3,118 | 3,303 | 2,806 | 2,929 | 3,220 | 3,547 | 4,642 | 5,903 | 6,856 | 7,453 |
| Injuries | 5,907 | 2,727 | 13,365 | 6,655 | 5,239 | 6,110 | 9,030 | 5,995 | 8,739 | 12,798 | 14,882 | 27,729 |
| Removing Snow, Ice and Sand | 9,947 | 7,001 | 51,059 | 58,891 | 51,961 | 56,516 | 29,202 | 79,076 | 131,206 | 248,093 | 245,770 | 384,700 |
| Miscellaneous | 78,449 | 39,105 | | | | | | | | | | |
| | \$849,021 | \$393,967 | \$454,810 | \$495,594 | \$420,147 | \$466,831 | \$497,031 | \$603,088 | \$796,358 | \$1,108,281 | \$1,263,092 | \$1,411,306 |

Note: Miscellaneous includes such items as signals and interlocking, depreciation, deferred maintenance, amortization and unclassified charges.
* Not shown separately since 1935.
† Includes signs, as well as fences and snow sheds.



Above: 1946 rail renewals, less than in 1945, were higher than in any year between 1931 and 1942, inclusive. Right: This C. B. & Q. repair shop at Clyde, Ill., completed in 1946, facilitates the repair and servicing of Diesel-electric locomotives

nance expenditures in 1946, compared with the years immediately preceding, that there was a corresponding reduction in the actual amount of work accomplished. One of the categories of work to show a substantial decrease was rail renewals. A table shows the number of gross tons of new rail applied in renewals by the Class I railroads for each year since 1925. For 1946, the amount shown is 1,218,000 gross tons, which is an estimate based on figures supplied to *Railway Age* by practically all Class I railroads, giving the tonnage of new rail installed by each of them for renewal purposes during the year. This figure represents a reduction of 396,000 tons, or nearly 25 per cent, compared with the rail laid in 1945, and is less than for any year since 1940. However, despite the unfavorable comparison with the war years, rail renewals in 1946 were larger than during any year of the 'Thirties with the single exception of 1930, when 1,517,002 tons of new rail were laid. While on the subject of rail, a significant development worth recording here is that during 1946 the American Railway Engineering Association adopted three new rail sections—115-lb. RE, 132-lb. RE and 133-lb. RE—to re-



place the 112-lb. RE and 131-lb. RE sections.

Crosstie renewals in 1946 also showed a substantial decline compared with the previous year. One of the tables gives the number of crossties that the Class I railroads have inserted in renewals in each year since 1925, the figure for 1946 again being an estimate based on figures furnished by most of the Class I roads. It is apparent from this table that the renewals for 1946, amounting approximately to 37,000,000 ties, were less by 6,900,000, or 15.7 per cent, than the number of insertions in 1945. This decline brought tie renewals last year to the lowest level in many years, possibly to an all-time low. In fact, the estimated renewals for 1946 were even less than the figure for 1933, the low point of the depression, when renewals amounted to 37,295,716 ties.

Why was there a considerable slump

in maintenance activity in 1946? This question is especially interesting in view of the fact that all portents at the beginning of the year pointed to a relatively high rate of activity. During the war years the record load of traffic being carried administered a terrific beating to the fixed properties, especially the tracks, and in spite of strenuous efforts on the part of the maintenance forces during that period, which were hindered by inadequate supplies of labor and materials, most of the railroads of the country came out of the war with their properties reflecting considerable amounts of deferred maintenance.

For example, during the war period the railroads consistently received less rail than they estimated was needed to meet their minimum requirements based

on the heavy traffic being carried. As soon as the war ended, therefore, many of them looked forward to catching up on their rail renewals as quickly as possible, beginning with extensive programs in 1946. However, obstacles immediately began to be encountered. In the first place the steel mills, faced with an avalanche of orders from every direction following the end of war-time controls, were unable to commit themselves to deliver the tonnage the railroads desired to order. As it developed, they were not able even to make deliveries in all cases on the basis of the orders accepted, this being due to interruptions to production caused primarily by strikes in the steel and coal-mining industries.

As with rail, crosstie renewals during the war years were held below actual needs on many railroads because of the persistent shortage of new ties that prevailed due to inadequate production. In

This view of the railroad traffic is terrific especially in the winter months of the year. The maintenance of the railroad is a constant problem. The period of the year is less than the period of the year based on the

the fall of 1945 a sudden increase occurred in crosstie production, which was continued into 1946. This encouraging increase in production was accompanied by a slow but persistent increase in stocks of crossties held in producers' yards, which continued practically throughout 1946. The implications of this situation are that, with tie stocks accumulating faster than they were being used, the substantial reduction that occurred in crosstie renewals in 1946 was due to a factor or factors other than that of supply. Among these other factors, which affected rail renewals and other types of maintenance work as well as crosstie insertions, was a need for retrenchment stemming from wage and price increases not offset by increases in freight rates.

Also, indications are that a shortage of man-power had at least some influence in 1946 in limiting the amount of maintenance of way work done in general, especially such operations as ballasting and surfacing. With employment being maintained at a high level throughout the year in industry generally, competi-

discontinued this practice during 1946. On the whole it appears that the labor situation was rather spotty during the year, with the picture varying widely between different parts of the country. While few persons will subscribe to the thought that strikes in industry comprise a cloud that has a silver lining, it is true that the railroads in general found it easier to meet their needs for labor in localities where prolonged strikes were in progress.

Looking Ahead

The prospects for maintenance activity in 1947 are not easy to appraise. If the railroads are provided the wherewithal to carry out needed work, there is no question that the year will be an active one. This is true because most roads are a long way from catching up with the work that had to be deferred during the war years, and certainly little progress was made in this direction in 1946. Unquestionably, from a financial standpoint, and assuming that traffic will remain at a relatively high level,

the railroads will be in a much better position to undertake extensive work in 1947 than they were last year, this brighter picture being due to the increase in freight rates they have been permitted to put into effect.

In view of the recognized need for large programs and the prospect that maintenance allotments are likely to be more liberal, the question remains whether the railroads will be able to fulfill their needs for maintenance materials in 1947. All evidence points to the prospect that rails and fastenings will be the most critical materials, and that the mills may be hard put to supply the railroads with the quantities of these materials that they will desire. If any major dislocations in industry occur, such as extensive or prolonged strikes among steel workers or coal miners, deliveries of new rail to the railroads could fall considerably short of meeting their requirements.

Regarding crossties, reports from producers indicate that the production difficulties that prevailed in this field during the war years have to a considerable extent been resolved, and that the railroads as a whole will not have too much difficulty in obtaining the crossties needed to carry out the renewal programs projected for 1947.

As in maintenance, the railroads



Left: The Santa Fe's recently modernized station at La Plata, Mo. Such projects were limited by government regulation in 1946. Below: Part of the Union's improvement project at East Pittsburgh, Pa., showing under construction in the foreground a new 3-track bridge over 5 tracks of the Pennsylvania



tion was keen for workers of all classes. As far as railroad maintenance work was concerned, the situation was aggravated by the fact that domestic roads were required, at the beginning of 1946, to release the large number of workers who had been brought in from Mexico. The number of such workers engaged on American railroads reached a peak of approximately 69,000 in August, 1945, the great majority of whom were employed in maintenance of way work, and when these were removed a gap was created which was not easy to fill.

Another aspect of the labor situation in 1946 was that many railroads which had made it a practice to employ large numbers of high school boys during the vacation seasons of the war years largely

As many up on the rails in the first half of the year, the situation was aggravated by the fact that domestic roads were required, at the beginning of 1946, to release the large number of workers who had been brought in from Mexico. The number of such workers engaged on American railroads reached a peak of approximately 69,000 in August, 1945, the great majority of whom were employed in maintenance of way work, and when these were removed a gap was created which was not easy to fill. Another aspect of the labor situation in 1946 was that many railroads which had made it a practice to employ large numbers of high school boys during the vacation seasons of the war years largely

entered 1946 with large backlogs of improvement projects, involving additions and betterments to the properties, which they hoped to whittle down considerably by doing substantial amounts of such work during the year. These backlogs were made up largely of projects involving improvement work of the types designed to replace obsolete facilities, to speed both freight and passenger service through terminals as well as on the line, and in general to enhance the attractiveness of railway service to shippers and the traveling public.

For many years the railroads have been restricted in their ability to carry out such projects, first because of the lack of funds, as during the depression years, and then because of the restrictions and shortages that prevailed during the war years.

In 1946 the railroads were only moderately successful in getting started on their post-war improvement programs. A number of factors were present which had the effect of inhibiting the total amount of construction work that could be carried out. One of these, of course, was the disappointing trend of earnings. Another was provided by the regulations of the Civilian Production Administration which prohibited building construction or modernization without specific authorization, with the exception of specified types of small jobs. The effect of these regulations was to prevent railroad building undertakings costing more than \$15,000, except where special authorization was obtained. Later in the year these regulations were further stiffened by an amendment restricting the \$15,000 exemption for work on specified transportation or other buildings to structures having a floor area of 10,000 ft. or more, and limiting the smaller buildings of these types to a \$1,000 small-job allowance.

While many types of railroad improvement projects were not covered by the C. P. A. regulations, and while the railroads were able to obtain authorization to proceed with certain essential types of building undertakings, such as those involving the construction of Diesel repair and maintenance shops, these regulations did have the effect of curtailing severely a type of improvement work that the roads are particularly anxious to undertake on a large scale, namely, the replacement and modernization of many obsolete and out-moded passenger stations.

Easier Building Controls?

However, as the year drew to a close there appeared to be a strong possibility that, following President Truman's action of December 14 in removing practically all restrictions on residential con-

struction, similar action soon would be undertaken, either by the President or by the new Congress, to eliminate or greatly liberalize the restrictions now governing industrial building.

Some Typical Projects

Primarily because of the factors mentioned above, it is probable that in 1946 the amount of improvement work the railroads were able to carry out fell somewhat below the total of such work performed in 1945, when it amounted to about \$248,000,000. However, if the improvement work carried out during the year was anywhere near the figure for 1945, it was at a considerably higher level than during the immediate pre-war years, as expenditures for this purpose averaged only \$134,865,700 annually for the ten-year period ended with 1941.

The character of the improvement projects undertaken or completed by the railroads during 1946 can best be illustrated by reference to typical specific projects. Among the larger undertakings may be mentioned the following: The provision of additional yard and engine-servicing facilities by the Baltimore & Ohio at East St. Louis, Ill., at a cost of \$2,231,000; the construction by the same company of extensive coal-handling facilities at Lorain, Ohio, \$3,700,000; the extension and modernization of shop facilities at Chicago by the Chicago, Rock Island & Pacific, \$1,700,000; an extensive new pier, with auxiliary facilities, on the Norfolk & Western at Lambert Point, Va., \$5,750,000; a track and bridge improvement project on the Union Railroad at East Pittsburgh, Pa., \$2,750,000; a new general office building on the New York, New Haven & Hartford at New Haven, Conn., \$2,000,000; new shop buildings on the Chicago, Milwaukee, St. Paul & Pacific at Milwaukee, Wis., \$1,457,000; and a line revision, involving the construction of a new tunnel, on the Chesapeake & Ohio at Ft. Spring, W. Va., \$2,254,500.

Other typical projects on which work progressed in 1946 include improvements to 41 bridges on the B. & O. at a cost of \$1,700,000; the construction of a new yard by the Chicago, Burlington & Quincy at West Quincy, Mo., \$938,702; construction by the Erie of a new passenger station at Akron, Ohio, \$500,000; replacement of a bridge across the West Pascagoula river by the Louisville & Nashville at Gaudier, Miss., \$797,526; modernization of the passenger station of the Norfolk & Western at Roanoke, Va., \$345,000; a single-story produce warehouse on the Union Pacific at Omaha, Neb., \$221,200; new well pump-houses, pipe lines and electrically-operated pumps on the Union Pacific at Orchard, Idaho, \$299,500; construction on the Wheeling & Lake Erie of new

engine and yard terminal facilities, including enginehouse, coaling plant, sanding plant, and water treating facilities, at Cleveland, Ohio, \$593,476; construction on the Seaboard Air Line of Diesel locomotive repair shop facilities at Jacksonville, Fla., \$815,000; new freight-house facilities on the St. Louis-San Francisco at Birmingham, Ala., \$236,866; construction of reinforced concrete linings in two tunnels on the Pittsburgh & West Virginia, \$207,000; a new car repair shed on the Great Northern, at Seattle, Wash., \$243,100; a curve and grade reduction project on the Chicago, Milwaukee, St. Paul & Pacific, between Glenham, S. D., and Selby, \$650,000; and the replacement of a frame coaling station with a concrete structure on the C. & O. at Paintsville, Ky., \$193,500.

Prospects for 1947

In spite of these and many other similar projects undertaken, carried forward or completed in 1946, it is not too much to say that the railroads have barely scratched the surface of the problems involved in bringing their properties up to date in every respect. For this reason, and given conditions somewhere near normal in 1947, there is reason to believe that construction activity in that year will not be less, and should be considerably more, than the level that prevailed in 1946. Especially to be looked for is a notable increase in activity in the construction and modernization of railway stations, the volume being related to remaining government restrictions still governing this type of work.

Grade Crossings

There is still another class of improvement work which, after being severely curtailed for a number of years, promises to show increasing activity as time goes by. This is the elimination or protection of railway-highway grade crossings. Under federal appropriations there is available to the states for grade-crossing elimination and protection work approximately \$50 million a year for the three-year period that began with July, 1945, plus a backlog of unobligated funds of approximately \$50 million, making a total of about \$200 million which can be made available for this work in the three-year period mentioned. It should be understood that there is no provision requiring that this money be spent for grade crossing work, the decision in this matter being up to the individual states, and for this reason it will behoove the railroads to take an interest in the matter to insure that the funds will be spent for the purpose for which they were intended.

New Power Shows Way to Economies

Railroads learned to use locomotives

during war in a manner that will stand

them in good stead for years to come

By H. C. WILCOX

Associate Editor



THE first full year of peace-time railway operation—the 12 months ending October 31, 1946—only served to drive home to the mechanical and operating men of American railroads a lesson that was learned during the four war years, as far as motive power was concerned—that locomotives, whether they be brand new Diesel-electrics, modern steam or not-so-new steam, can be utilized a far greater proportion of the time than was ever before thought possible if the right kind of facilities are provided for their servicing and if intelligence is used in their dispatching. Also, that if maximum utilization is an objective and the design of power and its servicing is influenced with that end in view, the chances are that its cost, whether on a locomotive-mile or a gross ton-mile-hauled basis, will be pleasingly low.

No discussion of motive power would be complete that did not pay tribute to the outstanding job done by the Diesel-electric, in both freight and passenger service, in the yard as well as on the road—for, whatever may have been the records established in helping the railroads hold up their end in the winning of the war, many of these records were equalled or exceeded in the difficult period of the past 12 months. So thoroughly has the Diesel-electric sold itself to both the operating and the mechanical men that the locomotive orders for 1946 are again predominantly for that

The first full year of peace-time operation has served to emphasize the value of the lessons learned during the war for, with the falling off of traffic and the return to seasonal operation, the obsolete units of motive power are now largely relegated to the less important jobs and the modern steam, electric and Diesel-electric units are turning in performance records that will establish new highs in the operating averages and—it is to be hoped—new lows in per-mile maintenance costs.

type of power, a total of over 500 units, road freight and passenger, as well as switching, being ordered by American railroads, as compared with a total of 77 steam locomotives of all types.

Cost and Performance

Railroad men should be eternally grateful to the Diesel-electric locomotive for one thing, if nothing else; that, because it is a high-priced facility, from the standpoint of initial investment, it has forced the railroads to do three things: keep accurate records of its cost, watch

its performance, and provide it with modern, clean and efficient facilities for its servicing and general maintenance. These are things which some roads were gradually becoming more and more negligent with in respect to the older steam power. Now, having learned the valuable lesson as a result of the operation of Diesel power, many roads are discovering that it is distinctly worth while to do all of these things in connection with the operation of steam power. This, in the face of rapidly mounting operating costs, is going to be of invaluable assistance in getting the most out of the more than 37,000 steam locomotives, a substantial proportion of which will be in service on our railroads for many years to come.

Two things have already been learned, as a result of the analysis of existing Diesel motive power operating cost figures; that the proportions of labor and material costs on this new form of power follow much the same general relationships as with steam power, and that the older the units become the greater becomes their maintenance costs—for, after all, this is but another piece of machinery that follows, for all of its modernity, the pattern of all things mechanical. The real advantages so far have been lower per-mile costs, higher utilization and high-speed hauling capacity and a resultant distinct economy when considered on the cost per gross ton-mile basis.

In 1945 and 1946, for the first time,

Table I—Selected Statistics of Motive Power and Freight Train Performance

| | Total freight locos. | Unservice- able | Stored Service- able | Active locos. | Per cent active to total | Loco. miles (000) | Gross ton-miles (000,000) | Freight train-miles (000) | Freight car-miles (000,000) |
|----------------|----------------------------|--------------------|----------------------------|------------------|--------------------------------|-------------------------|---------------------------------|---------------------------------|-----------------------------------|
| 1929 | | | | | | | | | |
| October..... | 28,912 | 4,417 | 2,680 | 21,755 | 75.3 | 64,756 | 110,444 | 55,748 | 2,783 |
| 1942 | | | | | | | | | |
| October..... | 22,027 | 2,344 | 340 | 19,343 | 87.8 | 70,461 | 141,880 | 60,717 | 3,155 |
| 1943 | | | | | | | | | |
| October..... | 22,037 | 2,703 | 335 | 18,999 | 86.2 | 70,084 | 145,076 | 60,355 | 3,185 |
| 1944 | | | | | | | | | |
| October..... | 22,398 | 2,796 | 465 | 19,137 | 85.6 | 67,948 | 143,539 | 58,884 | 3,115 |
| 1945 | | | | | | | | | |
| January..... | 22,414 | 2,911 | 342 | 19,161 | 85.3 | 65,637 | 127,440 | 56,885 | 2,768 |
| February..... | 22,464 | 2,949 | 381 | 19,145 | 85.0 | 60,895 | 122,608 | 52,747 | 2,654 |
| March..... | 22,456 | 2,741 | 349 | 19,366 | 85.9 | 69,276 | 143,852 | 59,901 | 3,150 |
| April..... | 22,323 | 2,977 | 441 | 18,905 | 84.7 | 65,739 | 138,369 | 57,080 | 3,043 |
| May..... | 22,339 | 3,016 | 520 | 18,803 | 84.3 | 68,852 | 145,792 | 59,939 | 3,205 |
| June..... | 22,352 | 2,861 | 621 | 18,870 | 84.3 | 65,750 | 139,723 | 57,155 | 3,042 |
| July..... | 22,307 | 3,096 | 628 | 18,583 | 83.3 | 65,067 | 136,869 | 56,547 | 2,988 |
| August..... | 22,297 | 3,098 | 817 | 18,382 | 82.4 | 61,916 | 128,842 | 53,895 | 2,838 |
| September..... | 22,261 | 3,240 | 1,121 | 17,900 | 80.3 | 56,907 | 118,012 | 49,477 | 2,576 |
| October..... | 22,311 | 3,170 | 1,221 | 17,920 | 80.3 | 57,412 | 114,445 | 50,319 | 2,538 |
| November..... | 22,257 | 3,199 | 1,113 | 17,945 | 80.6 | 56,725 | 113,176 | 49,424 | 2,482 |
| December..... | 22,007 | 3,311 | 850 | 17,846 | 81.0 | 56,283 | 106,035 | 49,124 | 2,329 |
| 1946 | | | | | | | | | |
| January..... | 21,948 | 3,384 | 910 | 17,654 | 80.4 | 57,971 | 111,686 | 50,525 | 2,466 |
| February..... | 22,036 | 3,662 | 945 | 17,429 | 79.0 | 53,682 | 105,111 | 46,890 | 2,342 |
| March..... | 22,123 | 3,627 | 1,073 | 17,423 | 78.8 | 59,722 | 121,109 | 52,174 | 2,679 |
| April..... | 22,186 | 3,763 | 2,448 | 15,975 | 72.0 | 49,877 | 92,896 | 44,373 | 2,178 |
| May..... | 22,274 | 3,682 | 2,075 | 16,517 | 74.1 | 47,308 | 95,278 | 41,644 | 2,161 |
| June..... | 22,039 | 3,722 | 1,387 | 16,930 | 76.9 | 55,252 | 115,379 | 48,216 | 2,542 |
| July..... | 22,026 | 3,684 | 1,153 | 17,189 | 78.0 | 57,949 | 118,994 | 50,765 | 2,627 |
| August..... | 21,968 | 3,584 | 995 | 17,389 | 79.1 | 60,397 | 126,503 | 52,805 | 2,768 |
| September..... | 21,962 | 3,784 | 912 | 17,266 | 78.6 | 56,937 | 119,185 | 49,803 | 2,583 |

Note: Data in Columns 1 to 4 from I. C. C. Statement No. M-240 "Motive Power and Car Equipment"; Columns 6 to 9 from I. C. C. Statement No. M-211 "Freight Train Performance"; Column 5 calculated.

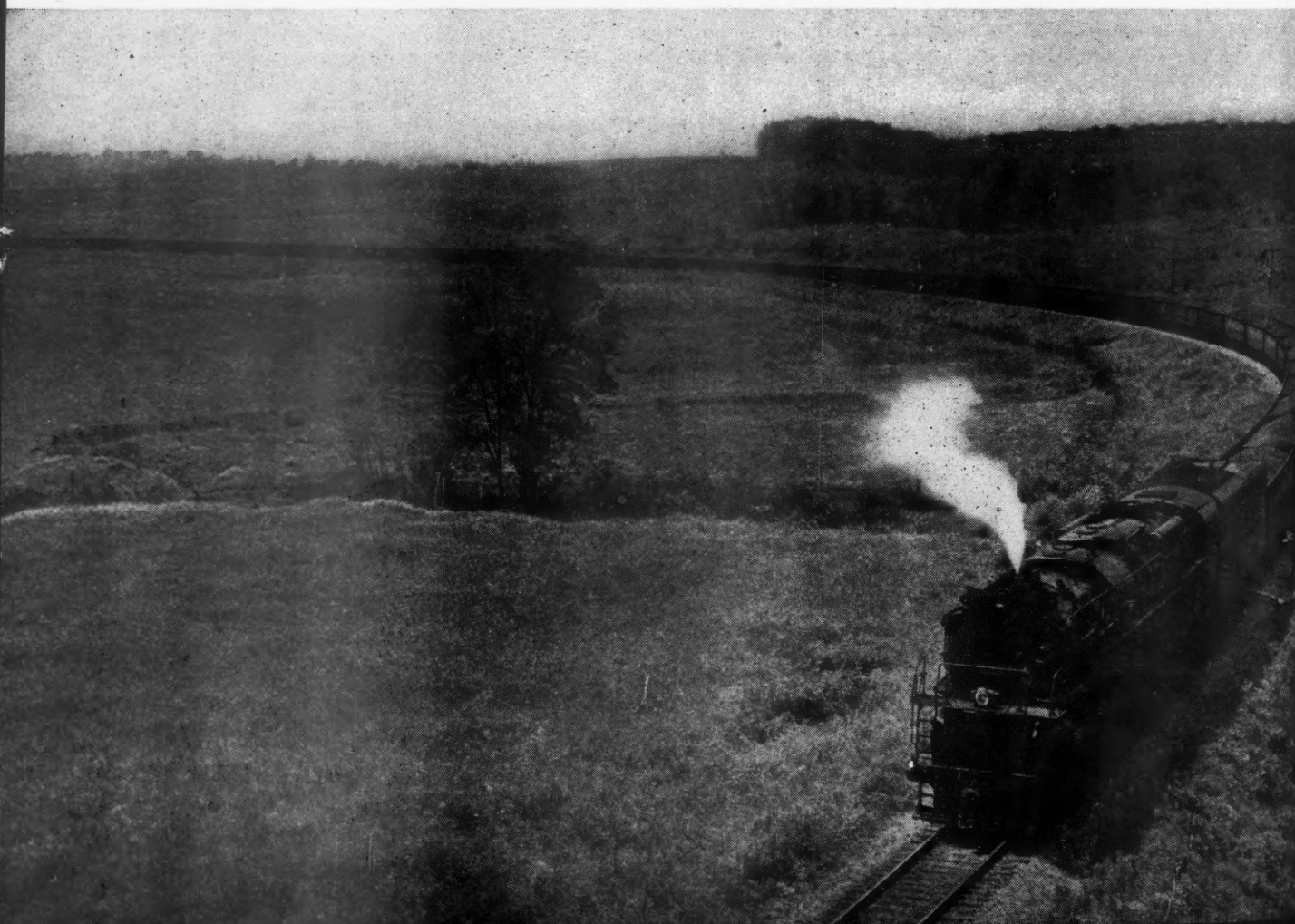
the breakdown of operating statistics has revealed some of the outstanding performances of Diesel-electric—and electric—motive power in both freight and passenger service. We have always known that the operating averages of train and locomotive performance did not tell the entire story for, regardless of the fact that a substantial portion of the locomotive inventory was modern power and that modern power is always a better and more efficient performer than old and

obsolete power, the fact that about 65 to 75 per cent of the locomotives, in any year, have been more than 20 years old has, in the final averages of operation, always obscured the better showing of the modern power.

Now, since both locomotive and train performance statistics have been separated between steam, Diesel and electric we are able to see the real difference in the showing. Compare, for example, the operating average of train-miles per

train-hour in the 1946 statistics with any year prior to 1944 and it will be seen that the fine performance of the Diesel is completely covered up by the averages of the heavy inventory of steam power, most of it obsolete as far as modern operating requirements are concerned.

In 1946 this average, in freight service, was 15.7 for steam-operated freight trains and 35.0 for steam-hauled passenger trains. The Diesel-electric, on the other hand, shows an average of 21.8 in



freight
servi
creat
45.0
in th
of m
up in
ation
tives

Du
motiv
overc
tial in
its D

1936.
Per
1937.
Per
1938.
Per
1939.
Per
1940.
Per
1941.
Per
1942.
Per
1943.
Per
1944.
Per
1945.
Per
1945*.
Per
1946*.
Per

* NI
Note
road p

Railw

Freight
car-miles
(000,000)
2,783
3,155
3,185
3,115
2,768
2,654
3,150
3,043
3,205
3,042
2,988
2,838
2,576
2,538
2,482
2,329
2,466
2,342
2,679
2,178
2,161
2,542
2,627
2,768
2,583

D. M-211

with any
seen that
Diesel is
rages of
er, most
operating
ht serv-
freight
passen-
on the
21.8 in



attention are ash handling and coaling. Coupled with the use of large-capacity tenders, well-equipped, centralized coal-handling points have a useful function in keeping servicing time at a minimum. Examples of some of the facilities installed in an up-to-date coaling station are chutes capable of delivering coal to the tender at a rate of 30 or more tons per minute. The removal of dumped ashes is made easier by ash cars under the tracks. Electric heaters are installed to prevent freezing. Washout pressures in the neighborhood of 100 lb. per sq. in. quickly clean out the ash pans.

Given such coal and ash handling services along with track pans or tenders with a large water reservoir, the modern, well-proportioned steam locomotive should be able to compete favorably with any form of motive power on a schedule basis even with heavy trains. That steam has the required horsepower potential is attested by the fact that there are at least three designs of the 4-8-4 type that develop in excess of 5,000 drawbar horsepower.

On a cost basis, figures released by the Norfolk & Western show that maintenance costs for steam power can be very low. Its 4-8-4 type Class J locomotives had a *total* maintenance cost of only 13.34 cents per mile over a period of 4 1/3 years. Similar figures for the Norfolk & Western 2-6-6-4 locomotives, which develop 6,300 drawbar horsepower at 45 m.p.h., are 21.12 cents, while 2-8-8-2 compounds are 23.76 cents per mile.

Two factors that appear likely to have an important bearing on the future of steam power will be under close scrutiny during the coming year. Several roads have welded boilers, whether in use or on order. The application of this type of construction is expected to have a marked effect on maintenance and utilization.

The poppet valve gear may prove to be

freight service and 45.2 in passenger service. The electric locomotive helps create comparable averages of 17.7 and 45.0 respectively. There is still one flaw in these figures;—the real performance of *modern* steam power is still covered up in the averages created by the operation of more than 33,000 steam locomotives that are not modern in any sense.

Steam Power Improving

During the past year the steam locomotive has made additional strides in overcoming the handicap of the differential in obtainable mileage between it and its Diesel-electric competitor. Groups of

modern steam locomotives have demonstrated the feasibility of averaging over 25,000 miles per month per unit when given selected assignments and adequate servicing facilities both en route and at terminals. Modern design of both power and repair facilities has made it possible and practical to complete monthly boiler washes between runs and annual inspections in two days, thus enabling the locomotive to remain in service virtually every day of the year.

Servicing facilities en route, which are of particular importance in the maintenance of fast schedules, are adding many refinements. Among the principal delays to steam power that are receiving

Table II—Locomotive Mileage—By Locomotive Type and Class of Service

| | Road freight (000) | | | | Road passenger (000) | | | | Freight train switching (000) | | | |
|------------------------|--------------------|---------|------------------|----------|----------------------|---------|------------------|----------|-------------------------------|--------|------------------|----------|
| | Total | Steam | Diesel and other | Electric | Total | Steam | Diesel and other | Electric | Total | Steam | Diesel and other | Electric |
| 1936..... | 546,418 | 539,019 | 65 | 7,334 | 371,858 | 355,375 | 1,269 | 15,213 | 47,976 | 47,410 | ..... | 564 |
| Per cent of total..... | | 98.6 | 0.12 | 1.3 | | 95.5 | 0.4 | 4.1 | | 98.7 | ..... | 1.17 |
| 1937..... | 564,021 | 556,518 | 79 | 7,424 | 384,971 | 364,814 | 4,051 | 16,016 | 48,496 | 47,917 | 31 | 547 |
| Per cent of total..... | | 98.6 | 0.14 | 1.3 | | 95.0 | 1.0 | 4.2 | | 99.0 | 0.1 | 1.12 |
| 1938..... | 471,025 | 461,220 | 135 | 9,669 | 357,120 | 332,883 | 7,615 | 16,722 | 40,962 | 40,376 | 51 | 535 |
| Per cent of total..... | | 97.8 | 0.28 | 2.0 | | 93.2 | 2.1 | 4.7 | | 98.6 | 0.12 | 1.3 |
| 1939..... | 507,850 | 495,465 | 216 | 12,170 | 357,339 | 329,308 | 10,476 | 17,555 | 43,561 | 42,812 | 37 | 712 |
| Per cent of total..... | | 97.6 | 0.43 | 2.4 | | 92.2 | 2.9 | 4.9 | | 98.2 | 0.1 | 1.6 |
| 1940..... | 543,728 | 530,305 | 527 | 12,895 | 362,312 | 324,075 | 19,781 | 18,456 | 45,991 | 45,077 | 89 | 824 |
| Per cent of total..... | | 97.4 | 0.97 | 2.4 | | 89.5 | 5.4 | 5.1 | | 98.1 | 0.2 | 1.8 |
| 1941..... | 645,980 | 629,622 | 1,712 | 14,646 | 380,269 | 329,411 | 30,805 | 20,053 | 52,673 | 51,551 | 245 | 877 |
| Per cent of total..... | | 97.5 | 2.65 | 2.2 | | 86.6 | 8.1 | 5.3 | | 97.9 | 0.5 | 1.7 |
| 1942..... | 770,096 | 749,736 | 5,778 | 14,582 | 421,203 | 358,798 | 39,581 | 22,823 | 57,000 | 55,757 | 501 | 742 |
| Per cent of total..... | | 97.5 | 0.8 | 1.9 | | 85.2 | 9.4 | 5.4 | | 97.9 | 0.9 | 1.3 |
| 1943..... | 813,493 | 789,845 | 9,525 | 14,123 | 455,908 | 400,225 | 40,995 | 24,688 | 55,439 | 54,050 | 653 | 735 |
| Per cent of total..... | | 97.2 | 1.2 | 1.7 | | 85.9 | 8.8 | 5.3 | | 97.6 | 1.2 | 1.3 |
| 1944..... | 806,325 | 770,267 | 21,575 | 14,468 | 471,160 | 412,393 | 33,349 | 25,407 | 54,149 | 52,488 | 857 | 751 |
| Per cent of total..... | | 95.6 | 2.7 | 1.8 | | 87.5 | 7.1 | 5.4 | | 97.1 | 1.6 | 1.4 |
| 1945..... | 750,024 | 698,305 | 38,139 | 13,570 | 477,358 | 410,196 | 41,685 | 25,477 | 52,199 | 50,165 | 1,339 | 685 |
| Per cent of total..... | | 93.1 | 5.1 | 1.8 | | 85.9 | 8.7 | 5.3 | | 96.1 | 2.6 | 1.3 |
| 1945*..... | 579,603 | 541,732 | 27,443 | 10,421 | 350,158 | 301,613 | 29,696 | 18,850 | 39,377 | 37,977 | 969 | 531 |
| Per cent of total..... | | 93.5 | 4.7 | 1.8 | | 86.1 | 8.5 | 5.4 | | 96.2 | 2.5 | 1.3 |
| 1946*..... | 499,094 | 454,533 | 34,531 | 10,023 | 332,706 | 272,413 | 41,613 | 18,681 | 37,324 | 35,641 | 1,225 | 459 |
| Per cent of total..... | | 91.2 | 6.9 | 2.0 | | 81.9 | 12.4 | 5.7 | | 95.5 | 3.3 | 1.2 |

* Nine months.

Note: Data on road freight and freight-train switching locomotive mileage taken from I. C. C. Statement No. M-211 "Freight Train Performance"; data on road passenger locomotive mileage taken from I. C. C. Statement No. M-213 "Passenger Train Performance."

the answer to the problem of preventing the rapid drop in horsepower that occurs in steam locomotives at high speeds. Tests under way on New York Central locomotive No. 5500 are expected to show what the poppet valve system can do for a locomotive that is modern and well-designed in every respect.

What the Statistics Show

The statistics relating to motive power and freight train performance which are appended in Table I reveal some interesting and significant changes that have taken place in the first full year of peacetime operation. For the first time since the fall of 1940 we are able to appraise the freight traffic in the country in the light of normal operation—in other words, we have departed from the high month-to-month traffic rates that were attained during all of the war years and are returning to the seasonal operations that ordinarily characterize railway traffic.

Immediately after the end of the war, in August, 1945, the freight traffic of the Class I roads, as indicated by gross ton-miles and freight train-miles dropped off steadily from a figure of 128.8 billion in August, 1945, to a low of 92.8 billion in 1946. The statistics of motive power show that the railroads did an excellent job of appraising the value of their motive power by immediately placing in storage the older and less efficient locomotives so that for the first time in many months the number of stored serviceable locomotives rose to a high of 1,121, 1,221 and 1,113 in September, October and November of 1945. In spite of the fact that business was still headed downward, the number of stored serviceable locomotives was reduced in the following three months of December, January and February because a large number of locomotives were in or awaiting shop. The freight locomotives in this category totalled less than 3,600 out of an ownership of over 22,000 since the second month of 1946.

In April and May, 1946, as a result of labor difficulties in the coal, railroad and many other industries, the freight traffic dropped to a low of 92.9 and 95.3 billion gross ton-miles and in these two months the use of steam freight locomotives also fell to a record low of 72.0 and 74.1 per cent of active-to-total locomotives. In these same months the number of stored serviceable locomotives rose to 2,448 and 2,075 respectively.

Some indication of the volume of railroad business as compared with pre-war and pre-depression years is shown by the fact that in October, 1946, freight traffic rose to a total of 127.9 billion gross ton-miles and, in order to handle this business, 53.7 million freight train-miles were operated, requiring a total of 61.5

million locomotive-miles.

In 1929 56.7 million freight train-miles and 64.7 million locomotive-miles were required to handle 110.4 billion gross ton-miles and 75.3 per cent of the freight locomotive inventory was required to handle the business. In that year, 21,755 steam freight locomotives were in active service on the road—exactly 4,191 more than were used to handle the 127.8 billion gross ton-miles in October, 1946. This great reduction in the number of steam freight locomotives indicates not only the relatively greater efficiency and utilization of a substantial part of the existing steam power but also the great contribution that has been made to the handling of freight traffic by the Diesel-electric, which latter type of motive power, in 1946, accounted for 6.9 per cent of the freight locomotive mileage.

Table II is included to show the trend of locomotive mileage by locomotive type in freight and passenger service. In the nine-months' period of 1946, the Diesel-electric locomotive accounted for 12.4 per cent of the road passenger mileage, 3.3 per cent of the freight train switching mileage and, as previously mentioned, 6.9 per cent of the road freight train locomotive mileage.

With reference to the switching mileage shown in Table II attention is directed to the fact that the freight train switching mileage shown in the table is only that performance by road locomotives at terminals and way stations. As is well known, the major job of the Diesel-electric with respect to switching is done in the passenger and freight yards and in the same period of 1946 the Diesel-electric switchers accounted for 40.5 per cent and 28.3 per cent of the yard switching locomotive-hours in passenger and freight service respectively. Yard switching by steam switching locomotives has, in the past ten years, been

reduced to percentages of 50.7 and 70.9 in passenger and freight service respectively.

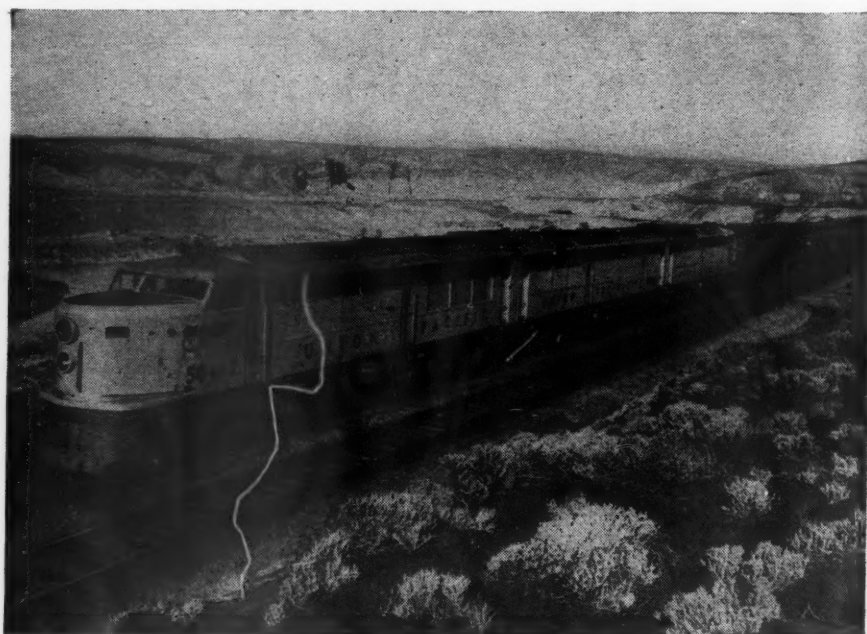
The statistics of locomotive ownership are of interest for two reasons: First, to compare the relation of ownership of the several types of locomotives to the locomotive mileage figures shown in Table II and second, to indicate the accuracy of calculations which have been made by the proponents of Diesel power to the effect that every Diesel locomotive that is placed in service replaces from 2 to 2.5 steam locomotives. This may be borne out by the figures, for between 1936 and 1946 the total steam locomotive inventory dropped from 44,285 to 37,732, a reduction of 6,553 units, while the number of Diesel—or gasoline—units increased, in the same period, from a total of 170 to 3,312, an increase of 3,242 units. The ratio of the increase in Diesel units to the decrease in steam units is 2.1.

A direct-drive steam turbine locomotive has been in service on the Pennsylvania since 1944. To date, no serious or fundamental weakness has appeared in either the testing or operation of this locomotive. Another larger geared-turbine locomotive is now under consideration.

Three coal-burning steam-turbine-electric locomotives are on order for the Chesapeake & Ohio.

There is considerable activity directed toward adapting the gas turbine to locomotive use. One company has a 2,000-hp. unit on test that burns liquid fuel. Orders have been placed with each of two manufacturers for turbines that will burn powdered coal.

Thus it may be seen that, with refinements in the design and use of existing types of power and the prospects for new types, the future of railway motive power is bright indeed.



and 70.9
e respec-

ownership
First, to
ip of the
the loco-
Table II
uracy of
made by
r to the
ive that
om 2 to
may be
between
locomo-
4,285 to
3 units,
or gaso-
e period.
increase
the in-
crease in

locomo-
e Penn-
no seri-
has ap-
peration
larger
w under

turbine-
der for

directed
bine to
has a
s liquid
with each
nes that

a refine-
existing
ects for
motive



4, 1947



One of an order of one thousand 55-ton steel box cars built for the New York Central by the American Car and Foundry Company

Box, Hopper and Reefer Supply Inadequate

**With war-time controls of car use still in effect,
the shortage of box cars is in excess of 100,000;
hoppers are 30,000 short and refrigerators, 10,000**

By C. B. PECK

Mechanical Department Editor

AFTER the railroads had established a record of war-time service in 1942 in which they reached new highs in utilization intensity of all of their facilities, 1943 saw the beginning of a progressively widening gap between the traffic actually moved and that offered for movement. This failure to meet the full demands of the nation was reflected in box-car shortages starting in the Northwestern district in July and spreading later in the fall into the Central Western and the Southwestern districts. At the end of that year competent appraisal of the effect of these shortages was that, while they had caused inconvenience and some loss in the grain-growing West, they had not caused any serious delay in the prosecution of the war.

Since 1943 the shortages have become continuous throughout each 12 months, spreading to take in open-top as well as box cars, and cropping up all over the country.

The effects have long since passed beyond the inconvenience stage and have become a menace to full expansion of industry and commerce. With anticipated relief from other factors which have restricted economic progress during 1946, a continuance of the present traffic ceiling will have far-reaching and detrimental consequences to the nation. Looking at the situation from the stand-

point of the railroads themselves, public relations will suffer and competition will be stimulated.

There are several parts to the railroad transportation machine which could be responsible for limiting the capacity of the railroads to serve: tracks, motive power, and freight cars. Shortages of track capacity and motive power, however, are likely to be manifested locally and are not likely to become general without long warning. The present car shortage is too general and became so too quickly after its first manifestation to be caused by anything but a direct shortage of freight cars. All of the indices of freight-car utilization point to the same conclusion.

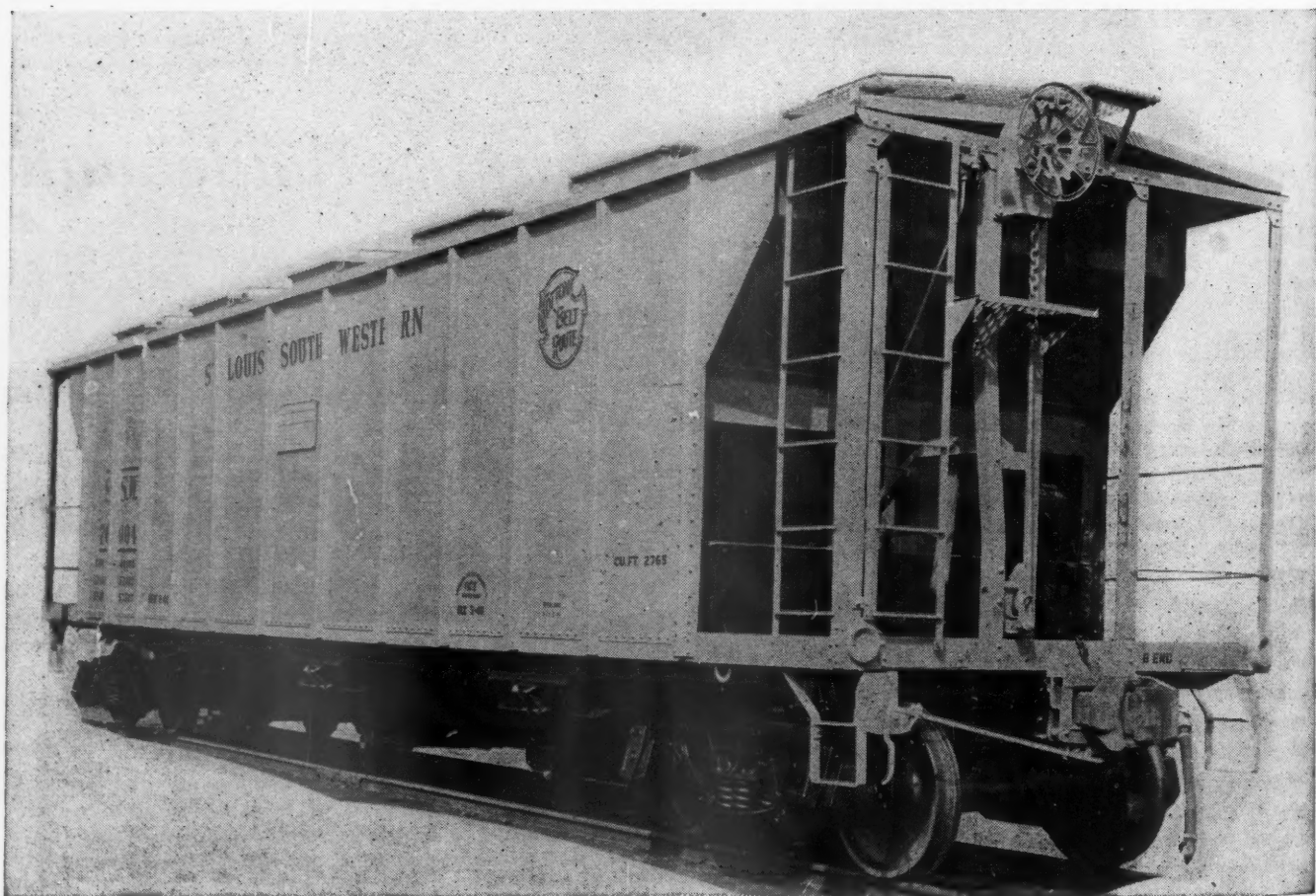
How many more freight cars would have been required to have eliminated

The failure to meet the full demands of the nation-wide continuation of high-level traffic is reflected in shortages of cars required for the movement of grain, perishables and solid fuels. What would have been the additional new-car requirements to have prevented the shortages that exist today? What will be the effect of the return to pre-war methods of loading on the car supply? These and other questions are discussed in this article.

top cars, a large percentage of which are of railroad ownership. Somewhere between 105,000 and 110,000 would have been box cars and the rest largely hoppers.

third quarter. The years under study are 1941, representing pre-war conditions, 1943 and 1944, the war period, 1945 and 1946, transition years, and the outlook for 1947. The data, basic and derived, are set forth in a table.*

*The use of Car Service Division car loading reports with I. C. C. data on car-miles and net ton-miles is a source of some inaccuracies. These are not believed to be of a nature to affect the main objective of their use.—Editor.



(1) Freight
(2) Tons
(3) Freight
(4) Car
(5) Surplus
(6) Surplus
(7) Active
(8) Active
(9) Carload
(10) Carload
(11) Net
(12) Net
(13) Carload
(14) Net
(15) Load
(16) Total
(17) Carload
(18) Active
(19) L.C.I.
(20) Net
(21) July

Average
From
From
Based
Based
Based

car and
subject
The o
carload
the 32 t
still high
same m
trols on
still in c
as long
tinue.
adequate
will prob
value. I
slipped
and will
A com
of 1941
load of 2
day. It
the carlo
amount o
31.5.
Dr. J.
of Railw
America
railways
ton-mile
mate has
reau of
istics, w
nue ton-
to 1941
500,000
fall than
dle all th
ton-mile
be neede
Assumin
carload
needed
spectivel
The pr

Freight-Car Performance and Prospective Car Requirements

| | July and August | | | | | Four possibilities for 1947 | | | |
|---|-----------------|---------|---------|---------|----------------|-------------------------------|------------------------|-------------------------------|------------------------|
| | | | | | | 644 billion revenue ton-miles | | 584 billion revenue ton-miles | |
| | 1941 | 1943 | 1944 | 1945 | 1946 | Return to 1941 | Partial Return to 1941 | Return to 1941 | Partial Return to 1941 |
| (1) Freight cars on line (000) ¹ | 1,869 | 1,981 | 1,976 | 1,944 | 1,905 | 2,418 | 2,248 | 2,204 | 2,043 |
| (2) Total car days for period (000) | 115,896 | 122,851 | 122,508 | 120,497 | 118,097 | 149,940 | 139,356 | 136,651 | 126,714 |
| (3) Freight cars out for repairs ² | 81,052 | 51,225 | 54,276 | 70,490 | 80,564 | 103,900 | 97,000 | 95,500 | 87,900 |
| (4) Car days out for repairs (000) | 5,025 | 3,176 | 3,365 | 4,370 | 4,995 | 6,450 | 6,000 | 5,900 | 5,440 |
| (5) Surplus cars (by weeks) ³ | 61,932 | 30,518 | 13,654 | 9,510 | 3,662 | 82,200 | 76,500 | 73,100 | 69,400 |
| (6) Surplus car days for period (000) | 3,840 | 1,892 | 847 | 590 | 227 | 5,090 | 4,740 | 4,520 | 4,300 |
| (7) Active car days (000) | 107,031 | 117,783 | 118,296 | 115,537 | 112,875 | 138,400 | 128,600 | 126,200 | 118,000 |
| (8) Active car days, per cent total car days | 92.3 | 95.8 | 94.2 | 95.8 | 97.5 | 92.3 | 92.3 | 92.3 | 92.3 |
| (9) Car-miles (000,000) ⁴ | | | | | | | | | |
| Loaded | 3,218 | 4,053 | 4,117 | 3,854 | 3,587 | 4,180 | 3,880 | 3,801 | 3,520 |
| Empty | 1,813 | 2,281 | 2,195 | 1,972 | 1,808 | 2,350 | 2,180 | 2,140 | 1,990 |
| Total | 5,031 | 6,334 | 6,312 | 5,826 | 5,395 | 6,530 | 6,060 | 5,939 | 5,510 |
| (10) Car-miles per car day (all cars) | 43.4 | 51.6 | 51.5 | 48.4 | 45.7 | 43.5 | 43.5 | 43.5 | 43.5 |
| (11) Net ton-miles (000,000) ⁵ | 95,304 | 137,143 | 135,216 | 125,183 | 114,702 | 122,108 | 122,108 | 111,000 | 111,000 |
| (12) Net ton-miles per loaded car-mile | 29.2 | 33.9 | 32.9 | 32.5 | 32.0 | 29.2 | 31.5 | 29.2 | 31.5 |
| (13) Cars loaded (000) ⁶ | 7,877 | 7,911 | 7,942 | 7,480 | 7,885 | 10,200 | 9,480 | 9,296 | 8,620 |
| (14) Net ton-miles per car loaded | 12,100 | 17,340 | 17,050 | 16,800 | 14,500 | 12,000 | 13,000 | 11,800 | 12,900 |
| (15) Loaded miles per carload | 409 | 512 | 519 | 518 | 454 | 409 | 409 | 409 | 409 |
| (16) Total miles per carload | 639 | 800 | 796 | 782 | 682 | 639 | 639 | 639 | 639 |
| (17) Car days per carload (all cars) | 14.7 | 15.5 | 15.4 | 16.1 | 15.0 | 14.7 | 14.7 | 14.7 | 14.7 |
| (18) Active car days per carload | 13.6 | 14.9 | 14.9 | 15.4 | 14.3 | 13.6 | 13.6 | 13.6 | 13.6 |
| (19) L.C.I., per cent of total carloads | 17.7 | 11.3 | 11.8 | 12.8 | 12.2 | 17.6 | 17.6 | 17.6 | 17.6 |
| (20) Net ton-miles for 12 months (000,000) ⁷ | 514,520 | 772,431 | 785,509 | 726,045 | 649,000 (est.) | 686,000 ⁸ | 686,000 ⁸ | 623,000 ⁸ | 623,000 ⁸ |
| (21) July and August ton-miles, per cent of 12 months | 18.5 | 17.8 | 17.2 | 17.2 | 18.0 | 17.8 ⁷ | 17.8 ⁷ | 17.8 ⁷ | 17.8 ⁷ |

¹ Average of four reporting periods from CS-60a, including cars of private ownership.

² From CS-44A.

³ From I.C.C. form 211-OSA.

⁴ From CS-54A.

⁵ Based on the Parmelee estimate of 584 billion revenue ton-miles during 1947.

⁶ Based on the estimate of the Interstate Commerce Commission, Bureau of Transport Economics and Statistics, of 644 billion revenue ton-miles in 1947.

⁷ Based on 1943 because of the normal traffic pattern during that year.

car and in the average haul are also subject to this same influence.

The downward trend of the average carload since 1943 has been slight and the 32 tons of last July and August is still high relative to the 29.2 tons of the same months of 1941. O. D. T. controls on l. c. l. and other loadings are still in effect and are likely to remain as long as serious car shortages continue. As cars become available in adequate numbers, however, this figure will probably drift back toward the 1941 value. Mileage performance has already slipped back nearly to the 1941 figure and will, no doubt, decline further.

A complete return to the conditions of 1941 would call for an average carload of 29.2 tons and 43.5 miles per car day. It is more probable, however, that the carload will be reduced by a smaller amount during 1947—hardly lower than 31.5.

Dr. J. H. Parmelee, director, Bureau of Railway Economics, Association of American Railroads, estimates that the railways may handle 584 billion revenue ton-miles during 1947. A larger estimate has been made by the I. C. C. Bureau of Transport Economics and Statistics, which suggests 644 billion revenue ton-miles. Going all the way back to 1941 car performance, it will require 500,000 more freight cars on line next fall than were available in 1946 to handle all the traffic offered in a 664-billion-ton-mile year; 300,000 more cars will be needed to meet the lower estimate. Assuming the more probable average carload of 31.5 tons, the additional cars needed are 240,000 and 140,000, respectively.

The present inventory of freight cars

is heavily loaded with obsolescence because of the inadequate additions of new units and the relatively small number of old cars which have been removed from service for demolition since the war began. During the six years from 1936-1941, inclusive, the average number of cars permanently withdrawn for sale or demolition was 68,600 cars per year. For the four years 1941 to 1946, inclusive, the average dropped to about 35,000 cars—hardly more than one-half of the pre-war average. Not only are many of the cars old, but they have been through the war years during which maintenance was, perforce, allowed to run behind because of shortages of material, manpower, and car-days.

Cost of Maintenance

It costs the railroads in the neighborhood of \$200 a year, on the average, to maintain a freight car. The cost of maintaining many of these old cars is much higher than the average. Such a situation presents an attractive opportunity to avoid the heavy expenditures required to restore and keep these cars in service by replacing them with new cars of modern construction. These cars will operate for six or seven years before they reach the level of maintenance costs at which they may thenceforth be expected to operate. During the first two or three years they require practically no expenditure for maintenance. During the next three or four years the cost of running repairs begins to increase, but it is still below the average until the first shopping. This saving in maintenance frequently turns out to be

an important factor in the economics of the acquisition of the new freight cars.

The supply of refrigerator cars, while not as short as that of box cars, has been extremely tight at recurring intervals during the year. From January to June perishable loadings were reported to have exceeded those for the corresponding period of 1945 by 5.5 per cent. By restrictions on the character of loading the use of the cars has been kept for perishable products requiring refrigeration. Reports also indicate that many of the cars now in service are badly in need of repair.

The number of reefers now available, of private and railroad ownership combined, is 138,000—about 9,000 less than were available in 1941. The orders placed in 1946 are only sufficient to restore the shrinkage which took place during the war.

New ideas as to what a refrigerator car should be, from the standpoint of service to the shipper of perishable products have been developed and crystallized by the work of the Refrigerator Car Committee of the United Fresh Fruit and Vegetable Association, making many of the cars now in service obsolete. Several cars embodying these ideas are now in service and they pre-empt more orders than have been placed recently when deliveries are assured.

One of the handicaps of the high-strength and lightweight metals in the struggle to gain ground as materials of freight-car construction is the fact that many railways are not willing to pay a premium price for a piece of equipment which may spend half or more of its life on foreign lines. Ralph Budd,

(Continued on page 67)



The first full post-war year brought to the railroads the highest peace-time passenger volume (measured in terms of passengers carried one mile) in their history. The number of customers was greater than any peace-time year since 1927. Military movements—reaching a peak at the start—declined precipitously to a relative trickle by midsummer. Other “must” travel dropped off somewhat. But travel-hungry folks rushed in to grab up the seats and berths thus vacated. While slow deliveries of new equipment, strikes, fuel shortages and indifference among a certain minority of passenger-contacting employees stood in the way of complete fulfillment of contemplated service improvements, riding on the train in 1946 was incomparably more pleasant than during the war. And, in a world of much higher prices, it was charged for on the old comfortable basis.

Speed, comfort and a good appearance came again to the forefront in 1946

Packin’ ’em in—But with a Flourish

The railroads made great strides in developing both major and minor services even though their greatest peace-time passenger business created problems

By WILLIAM H. SCHMIDT, JR.

Assistant Western Editor

THE first post-war year brought to the railroads the biggest peace-time passenger business they have enjoyed in their entire history, on the basis of eight-months’ official data in hand when this issue went to press. From January to August, 1946, inclusive, the railroads rolled up about 47 billion revenue passenger-miles—less than the 56, 64 and 59 billion records of the comparable portions of the war years 1943 to 1945, inclusive, but 51 per cent greater than the 31-billion mark of 1942, the first full year of war.

The number of revenue passengers carried—i.e., the bare number of customers, whether they bought much or little transportation—compared equally as well with 1942 and recent peace-time years, but was generally less than the records for the ’Twenties, when the rail-

roads had not yet lost their short-haul business to the bus and private automobile. Briefly, the railroads served about 541 million passengers in the first eight months of 1946, which was a greater number than that for the comparable period of any year since 1927, except for the three peak war years 1943, 1944 and 1945. Revenue passengers in 1946 exceeded those in 1942—a war year—by 29 per cent.

Passenger revenues in the first nine months of 1946 exceeded \$991 million, and were greater than in the comparable period of any year in history, except 1943 to 1945, inclusive. They exceeded the corresponding portion of 1942’s revenues by 43 per cent.

Passenger train-miles—a measure of service required to carry the business—in the first nine months of the year were

340,000,000, as compared with 354,000,000 in both 1945 and 1944; 344,000,000 in 1943; and 314,000,000 in 1942.

In 1946, utilization of equipment declined somewhat from the war years—due to a falling-off in troop movements for one thing—but the year’s average of 25.6 passengers per car was higher than in any year in history, except 1943 to 1945 inclusive, when the ratios were 31.7, 32.2 and 30.4, respectively. This also meant that congestion and crowding were considerably reduced, while, at the same time, railroad management obtained an almost unprecedented occupancy rate.

They were still “hanging on the cars” in 1946. The ratio of 10.17 cars per train showed almost no reduction from the 10.35 cars in 1945 and 10.31 in 1944, and was even better than the ratio for

1943, a year of considerably higher traffic. Next to the 1944-1945 ratio, 1946's was the most favorable of all time. Back in 1920 (when the number of passengers carried was at a peak) about 6.5 cars was the average passenger train.

The average revenue per passenger-mile in the first eight months of 1946 was 1.93 cents, which is higher than any year since 1935, though not much above the 1.92-cent average of 1942. It compares with 1.88 cents in 1945 and 1.87 cents in 1944. Since, within 1946, the average revenue per passenger rose from 1.85 cents in January to 1.98 cents in June, this increase in "take" per passenger may be attributed chiefly to the declining level of troops carried at land-grant or joint military agreement rates.

Troop Traffic Down; Civilian Up

Starting with a month of record troop travel, incident to the hasty redeployment and demobilization of the armed forces, the year 1946 saw this class of traffic fall steadily to become by mid-summer a minor proportion of total patronage. And since the military services hurried to move as many men as possible before the end of land-grant rates, effective October 1, it is likely that troop traffic fell still further during the latter part of the year.

Still, passenger business has not declined to the depressing levels which many "prophets" foresaw. Business and other necessity travel has held up better even than railroad managements anticipated, and the removal of restrictions unleashed a flood of pleasure movement which filled most trains to capacity.

Many of the carefully-laid plans for holding railroad customers by equipment and service improvements were balked by slow delivery of new cars during 1946, due to strikes pyramided on strikes, delays by sub-contractors in furnishing vital accessories, and material shortages. The attitude of a minority of employees too often strained customers' tempers. A railroad strike brought an all-but-complete cessation of service on some roads and two coal strikes brought nation-wide passenger train cuts.

But, through the confusion of the stresses and strains of post-war adjustments, there was discernible a heartening and steady improvement in passenger

service. In many cases it resulted from major additions to plant and wholesale schedule betterments. But, in a larger sense, it was the sum total of a host of steps—minor in themselves, but large in the aggregate—pushed forward by managements resolved to hold to the rails as much as possible of the vast traffic which the war had brought to them.

Restrictive Orders Cancelled

As the pressure of troop movements on existing equipment declined, the Office of Defense Transportation withdrew a number of important orders which restricted transportation in their favor. On March 15, General Order 53 (originally effective July 15, 1945), which prohibited the operation of sleeping car service in runs of 450 miles or less, was completely removed. Gradual restoration of sleeping car service within this mileage category had started February 15. Also, on March 15, General Order 52—which went into effect June 29, 1945—placing a limitation on advance reservation of railroad passenger accommodations, was removed.

Last O. D. T. orders off the books—on May 1—were 55 (effective since July 15, 1945) placing all coaches, baggage and express cars at the disposal of the military authorities, under an Association of American Railroads' agent, and 56 (effective since June 21, 1945), setting uniform occupancy standards for

all military services. With the latter's withdrawal, the Navy returned to its more aristocratic rule of "one-in-a-lower" versus the Army's two.

Excursion and Vacation Travel

In 1945, when the war was still on, a large segment of the population paid no attention to government and carrier admonitions not to travel, and endured all the discomforts and cold, rude stares which war-time pleasure travel entailed. With what joy then did the American citizenry flock to the mountains and the sea—and "just Aunt Minnie's"—in 1946, when the brakes were released and travel promoters talked about a "Victory Vacation Year." It is hard to nail down the facts statistically, but 1946 seems to have been a record year for pleasure travel by all forms of carriage, if the statements of the hotel keepers, tour agencies and travel editors are to be credited.

As they came out from under the load of troop movements and other essential travel, the railroads took on a larger share of pleasure traffic. Removal of O. D. T. restrictions opened the way for restoration of many pre-war features. Because it utilized the idle week-end time of cars to carry furloughs, the first post-war snow train was permitted to operate out of New York as early as January 27. Most roads restored pre-war summer schedules and many even added new resort trains. Back came solid trains for sum-

Passenger representatives came back from riding troop trains to tackle the travel market



mer campers, "anything-can-happen" railroad fan trips (on a somewhat limited scale), and "husking bee" trips. An eastern road ran the first of a series of railroad excursions to historical points for school children at the rate of a quarter-cent per mile, including meals and lodgings. While the railroads did not seek to promote railway-operated and conducted tours to national parks and other scenic spots, there was considerable individual traffic to these points.

Schedule Improvements

The year witnessed dramatic improvements in over-the-road time of through passenger trains, with the restoration of at least pre-war schedules on most through trains on most railroads. The schedule cuts were, in most cases, placed into effect in wholesale lots, starting early in April.

There occurred in 1946 one of the most important developments in recent passenger history. On March 31 three eastern and four western roads initiated through transcontinental sleeping cars between New York and Los Angeles, Cal., and San Francisco. Effective June 1, service between Washington, D. C., and Los Angeles was inaugurated over two routes and, the next day, an entirely new route between New York and Los Angeles was inaugurated. At present writing, through transcontinental sleeping cars are operating over 14 individual routes, with daily service on ten and every-other-day on the remaining four. While the through sleepers do not reduce transit time, they eliminate the necessity of changing trains at the mid-continent gateway. This long-discussed development posed—and continues to pose—difficult operating problems. But it appears to have met with warm public response, and, on most routes, it is reported that occupancy of the cars is more than satisfactory.

A second fertile territory for cars moving through gateway points was opened on July 7, when through service between New York, Texas and Mexico was established. This time some of the original participating carriers went beyond the through sleeping car, transferred at the gateway, and joined in the operation of a complete through train via the St. Louis (Mo.) gateway, where the union station makes it unnecessary to transfer cars between terminals. This service comprises both sleeping cars and coaches, with through dining and baggage cars. At the end of 1946 there were 17 through sleeping car and coach routes between East coast points and Texas, two of which extended to Mexico City, Mex. In addition there were three routes between New York and Oklahoma City, Okla. Finally, there was a com-

plete through train of sleeping cars, coaches, dining cars and baggage cars between New York and Fort Worth, Tex., on which no switching was performed at the gateway.

Getting Along with Customers

A study by the American Newspaper Publishers' Association indicated that no industry came through the war with such a gain in public esteem as the railroads. This esteem was won in spite of frequently poor service and stemmed largely from intelligent public realization of the tremendous task the railroads performed. But the 1946 survey of public opinion made for the A. A. R. indicates that the public is less docile, now that the war is over. Therein 28 per cent of the people said the roads could do better in service matters, compared with only 9 per cent in the 1945 survey. It is particularly noteworthy that no less than 41 per cent of frequent travelers by train expressed this opinion.

Believing that 1946 was the critical year in determining the future level of passenger traffic, a large number of railroads initiated elaborate—and sometimes expensive—programs of employee education and relations designed not only to combat widespread deterioration of morale among employees (which is paralleled or exceeded in every other large industry in the country), but to build up standards of workmanship and public contact even higher than pre-war. To mention but a few, the New York Central offered, as part of a broader program, a plan for the improvement of telephone contact with the public. The Southern Pacific, which utilized the group-discussion method for quick training of supervisors during the war, placed the program on a peace-time basis during 1946, broadened to include all classes of employees. An unusual development in employee education was the inauguration of night classes in passenger transportation matters meeting the public, at a cost of only \$3 per semester, sponsored by railroad traffic organizations in St. Louis, Mo. Many railroads have brought out special booklets, including those of the cartoon-illustrated type, to impress upon employees the importance of good customer relations.

Publicity and Advertising

Expenditures of the railroads for advertising during 1946 are not yet available, but it may be stated without fear of contradiction that, in general, the advertising and publicity efforts of the railroads in connection with passenger service were on the increase in 1946,

both in extent and quality. Railroad "ads" were more colorful than ever before. National magazines carried messages of individual railroads telling of the comforts and pleasures both now and in the future. Outstanding railroad ads of 1946 featured the change-over of the railroads from an arm of war to an agency of peace; increasing comforts of passenger service; the relative reliability of railway service and blueprints for the future.

During the year one eastern road went to the public with a frank statement regarding its inability to supply promised improvements in passenger services. It not only explained the difficulties which strikes and material shortages were causing but took the opportunity to inform the public on the serious consequences of starving the roads by inadequate freight rates.

The Boston & Maine, which before the war gained considerable good will by inviting school children to name its passenger locomotives, this year initiated a competition among school children to choose names for its new coaches and restaurant-lounge cars.

While the railroads continued to encourage passengers to check baggage not needed during the journey, a number of lines placed into effect important improvements in the handling of unchecked baggage. Inaugurated during the year was a new method whereby red caps and car porters unify their operations and bags are checked through from seat or berth to taxi stand.

Selling Transportation

Although they still stand as one of the roads' most vexing problems, the mechanics of reserving space on trains and selling tickets therefor were greatly improved during the year. Outstanding in this category was the poll of more than 20,000 business firms conducted by the Railroad Passenger Interterritorial Committee, proposing three types of ticket sales on credit and requesting a statement of preference. Unlike plans now in effect by the air lines, the proposed railroad scheme requires no deposit. Under Plan A, accredited travelers would carry an identification card bearing a plate for stamping check or draft forms which would clear through normal commercial credit channels. Under Plan B, the traveler would carry a supply of checks similar to conventional travelers checks. Under Plan C a commercial concern would issue drafts and an identification card and pay the railroads for the tickets sold in connection therewith.

The Pere Marquette inaugurated a "reserve-it-and-pay-as-you-go" plan early in August on its streamliners between Detroit, Mich., and Grand Rapids.

Railroad
n ever be-
ried mes-
telling of
both now
g railroad
ge-over of
war to an
omforts of
reliability
ats for the

road went
ement re-
promised
vices. It
ies which
ges were
ity to in-
us conse-
by inad-

ch before
good will
name its
r initiated
children to
ches and

ed to en-
baggage
a number
important
g of un-
d during
ereby red
ir opera-
ugh from

on

one of the
the me-
rains and
eatly im-
standing
of more
ducted by
territorial
types of
nesting a
like plans
the pro-
s no de-
travelers
ard bear-
or draft
h normal
der Plan
supply of
travelers
mmercial
an iden-
roads for
herewith.
urated a
o" plan
iners be-
d Rapids.

ry 4, 1947



There is no saturation point for the desire to go places

Under it, the traveler makes advance reservations by telephoning a station or ticket office, where the reservation is entered in his name. He then has nothing to do but board the train and proceed to his space, where a train attendant sells him a ticket. Passenger representatives, in addition, are equipped to make arrangements for return trips.

Late in 1946 it was announced that the P. M.'s plan would be extended to other trains on the road, and to trains on the Nickel Plate and the Chesapeake & Ohio early in 1947. In its extension, the plan will be broadened in its credit aspect to permit the sale of coach seats and Pullman space on credit cards. In the case of Pullman space, however, the credit card will be necessary on the "pay-as-you-go" plan. Actual institution of the plan awaits refinement of details.

At least one railroad during 1946 provided reservation bureaus at points of origin with space assignments for return trips which can be sold at the same time as the going trip, thus eliminating the usual delays entailed by wiring to destination points for assignments. It is noteworthy that similar arrangements for immediate confirmation of return trip reservations were tried out in a number of cities by the air lines in 1946.

Many passenger carriers continued to develop and extend the use of ticket-selling machines at important stations. Most of these are operated by ticket

sellers through the manipulation of selectors or keys, but there was at least one installation during the year of a machine operated by the passenger, very much in the manner of a gum-dispensing machine on a subway platform. Also developed during the year was a kind of mechanized filing system, which is said to speed up the making and recording of sleeping-car and seat reservations.

The "No-Show" Problem

The railroads and the Pullman Company continued to tackle the problem of what the air lines term "no shows," or unused, uncanceled reservations. It will be recalled that, early in 1942, when failure to use space was virtually a criminal act, Pullman proposed to refuse to redeem the price of tickets unless the space reserved was released for resale, and the number of the ticket erased from the diagram, in advance of the departure of the train for which it was sold. The sole exception to the rule was the traveller who missed connections due to delayed arrival of connecting trains. Waiving the criticism that, under such a rule, the Pullman Company might conceivably collect double charges on the same space, the Interstate Commerce Commission found the rule not unreasonable "for the period of the present war and a reasonable adjustment period thereafter."

In 1946, although the war was over,

the pressure on Pullman space continued unabated. Pullman, therefore, proposed to supplant the war-time rule by a regulation designed to eliminate the possibility of dual collection of charges on the same space, but tightening the turn-in of unused space to make for an orderly resale thereof. Resulting from conferences between Pullman and railroad executives, the new rule provided that ticket agents could refund the full amount for sleeping car tickets only if the space covered thereby was released not later than the day preceding departure of the car for which it was sold. If this were not complied with, the amount of refund depended upon the possible resale of the accommodation either by ticket agents or the conductor. The I. C. C. investigated the reasonableness of the new rule, and permitted it to go into effect on August 20. The first month's operation of the new refund tariff brought a 32 per cent reduction in unused space and a reduction of 65 to 70 per cent in returns on date of departure.

Dining Car Service

Effective October 15, the air lines placed into effect a service charge of 25 per cent of the entire one-way fare (not just the space charge) on air line tickets not cancelled by time of flight departure.

Dining car superintendents continued

to battle shortages of help, food, space and profit margins. As the year progressed, food became more plentiful, but shortages—especially in meat—were experienced as late as October. Until October 11, dining car prices were rigidly held to levels in effect between February 1 and April 10, 1943.

The year saw a considerable effort by a number of roads to educate dining car waiters to a higher standard of service and courtesy. The Illinois Central, for example, inaugurated a comprehensive training program, utilizing fixed classrooms, experienced instructors and a replica of a dining car. Many railroads made further experiments with prepared foods—including frozen foods—and worked toward increased cleanliness in the preparation of food. The latter endeavors were aided by the United States Public Health Service, which is equipped to advise methods of education and training of employees.

A step unprecedented in railroad history, as far as is known, was taken by the Pere Marquette in April when waitresses replaced waiters on the dining cars operated by the road. Experienced waitresses were hired and were provided away-from-home living quarters. This same road, on June 10, placed into effect a ban on tipping for service aboard its dining cars under an arrangement which, it announces, "is satisfactory to the service and kitchen personnel and compensates those employees, in part at least, for the loss of tips."

During the war station masters at a number of points made special arrangements for handling disabled men through terminals and onto trains. Unpleasant incidents in the holiday rush of 1945, however, made it clear that a general nation-wide arrangement was necessary. Accordingly, the A. A. R., the armed forces and the Veterans Administration arranged that the railroads would be given advance notice of travelers needing assistance, and railroad personnel and cooperating military and shore patrol police advised of special consideration to be extended them.

Effect of Strikes

The railroads' regular offering of passenger service received rude blows from strike actions during the year. Most serious, of course, was the nation-wide railroad strike of engine-men and trainmen which tied up railroad properties from 4 p.m., May 23, to 3:58 p.m., May 25. For a variety of reasons, however, passenger train service was not completely cut off during this period. For one thing, the brotherhoods officially permitted their members to operate troop and milk trains. For another, supervisory, salaried and executive officers of many railroads were able to keep in

motion passenger, mail and perishable freight trains to an extent ranging from virtually complete schedules to one or two per cent of complete. Also, many crews returned their trains to home terminal before abandoning their roads to idleness. Finally, the President's radio address on May 24 inspired a number of men to return to work before the strike was actually called off.

O. D. T. Orders

During the strike the O. D. T. was given wide powers to call upon the services of motor, air and water carriers to aid in moving of essential supplies and personnel. General Order ODT 66 directed that each railroad operating passenger trains "shall give preference and priority to the transportation of United States mail, and, when necessary to accord such preference and priority, shall limit or restrict the number of passengers transported on any passenger train." This order was revoked as of 6 p.m., May 25. There was no doubt that the government meant business. Had the strike not been called off when it was, it is likely that trains would have been manned by "G. I." engine-men, and passengers helped aboard by khaki-clad brakemen.

The railroad strike landed in the middle of a serious coal miners' "work stoppage" which produced government restriction of passenger-train mileage. On May 10, as the strike of the bituminous coal miners went into its sixth week, there became effective General Order ODT 60, which prohibited the roads from operating a daily coal-burning, passenger-service, locomotive mileage in excess of 75 per cent of that operated on April 1. Amendment No. 1 thereto prohibited the operation of special trains which the roads were not required, as common carriers, to transport.

On November 21, John L. Lewis called out his miners for the second time. Anticipating this action, the O. D. T. issued its General Order 68 on November 18, effective November 25, which, like its predecessor, directed the railroads to reduce coal-fired passenger train mileage by at least 25 per cent. Amendment No. 1 to the order, increasing the reduction to 50 per cent, scheduled for December 9, never went into effect because the miners' union boss backed down and called his men back to work on December 7.

Sale of the equipment and services of the Pullman Company to a purchasing group of about 50 railroads which handle 90 per cent of the Pullman business of the country, authorized by a special federal court on January 4, was held up by an appeal to the Supreme Court by the Department of Justice and rival bidders. The Pullman Company operated

its service without change during the year, pending an end to the litigation and an authorization to sell by the I. C. C.

The special travel sections which featured year-end issues of the daily newspapers predicted a record year in travel of all kinds in 1947. Allowing even for the optimism prevalent among travel promoters, it remains a fact that all the factors for such a record exist. People have money. During the last five years they have traveled far less than they wished. We are a more restless people than before the war, and our appetite for travel has been whetted by military journeys to the four corners of the earth. In 1946 a record number of people dared to risk crowded trains, buses and planes, jalopies in poor condition, bad hotels and restaurant service and extortionate prices to fulfill their desires for winter or summer vacations. Many of the inhibiting aspects of travel and vacationing will be absent from the scene in 1947, so that even the timid will embark upon their long-deferred junkets.

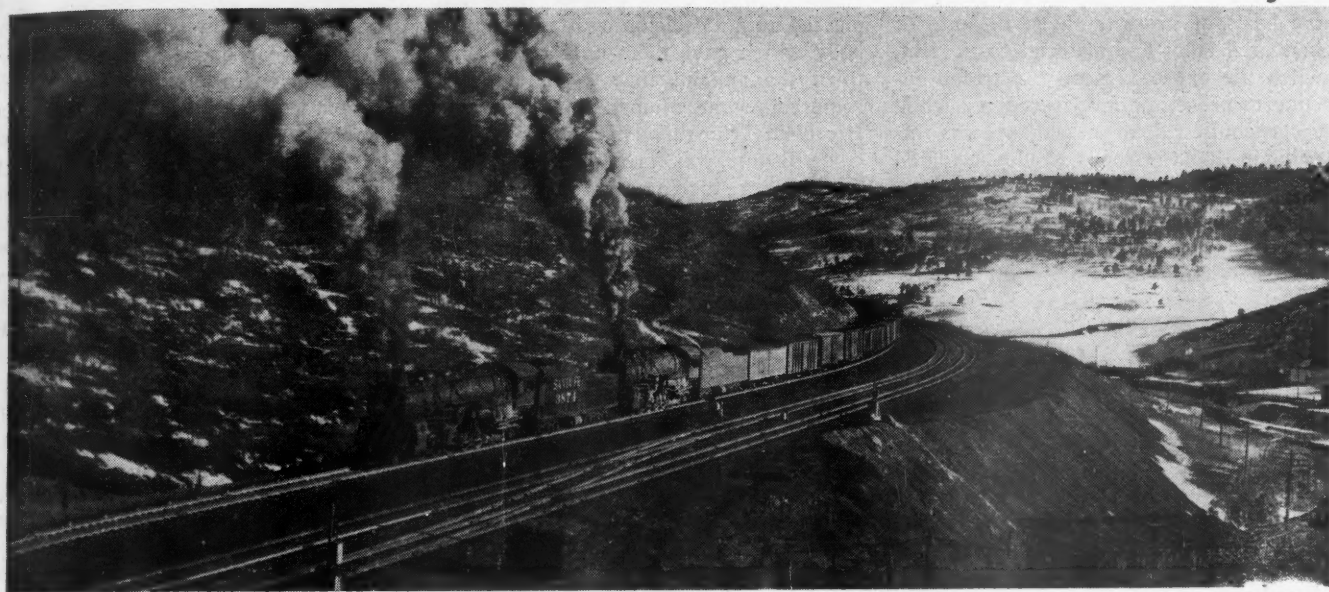
The passenger traffic manager of the Pullman Company believes that in 1947 Americans will do the greatest amount of traveling they have ever done. He predicts that the railroads will hold and expand their share of the enlarged travel market, which some travel promoters have estimated as \$10 billion in 1947, compared with \$6 billion during the last pre-war year. The persistent crowding of the facilities of their competitors makes it certain that the railroads will be able to capitalize on their outstanding advantages as mass transporters.

As the late Edward G. Budd pointed out, "Travel is one commodity which has no saturation point." The railroads may be regarded as "wholesalers" of passenger traffic. The fact that they handled a 400 per cent increase in passenger-miles during the war, compared with previous years, with an increase in train-miles of but 22 per cent, indicates flexibility that, with volume, can make peacetime passenger traffic profitable.

Railroad Rate Policy

It is time we made up our minds whether the railroads of the country are worth their keep. If they are, then they are certainly entitled to a living wage. In other words, they should be assured a reasonable prospect of making a profit high enough to attract investment capital. Only in this way can they replenish their equipment, modernize their plant and maintain the kind of service to which the public is entitled and which they have demonstrated their ability to provide.

—The New York Times.



Santa Fe Photo

Railway traffic in 1946 was at an all-time high for a peace-time year

Freight Traffic Sets Peace-Time High

Record levels reached in spite of rail and coal strikes; rising costs made a freight rate increase necessary, although this did not come about until January 1, 1947

By CHARLES ROBINSON
Associate Editor

LAST year was one of great contrasts in railway freight operations. It was marked by general service curtailments arising from strikes in the railway industry itself and in the coal industry. For two extended periods, one in the spring and one just ended last month, the movement of coal, the greatest single-commodity element in rail traffic, was at a virtual standstill. Also, for two days, from May 23 to May 25, the railway plant was almost completely idle because of a strike of members of the Brotherhood of Railroad Trainmen and of the Brotherhood of Locomotive Engineers. In spite of these interruptions to traffic and service, railway freight movement last year was at an all-time high for a non-war period, whether measured in tons carried or in tons carried one mile.

During the first eight months* of 1946 the railways carried 1,670,079,000 revenue tons of freight, nearly 100,000,000 tons more than during the same period of 1929, the previous peace-time peak, but about 35,000,000 tons less than in 1944, the war-time high period. In terms of revenue ton-miles, the roads produced an estimated 490,050,000,000 ton-miles during the first ten months* of the year, compared with 620,265,000,-

000 revenue ton-miles during the first 10 months of 1944, and 378,861,846,000 revenue ton-miles during the same period of 1929.

Further evidence of the vast amount of freight traffic moving over the railways in 1946 is seen in the fact that in spite of a drop in average revenue per ton-mile from 1.079 cents in 1929 (August) to 0.971 cents in 1946, nine month's* 1946 freight revenues were \$4,202,946,973, and exceeded those of the same 1929 period by nearly \$600 million. They were, however, slightly

over a billion dollars, or 20 per cent, below the 1944 war-time peak for the first nine months.

In spite of near-record traffic levels, railway net earnings in 1946 were not satisfactory, and on many of the major carriers were virtually, and in some cases actually, non-existent. Railway freight rates did not advance during the war years, although, as noted elsewhere in this issue, wages and the cost of railway fuel, materials and supplies advanced rapidly throughout the war and continued their rapid advance during 1946. Had the approximately 20 per cent higher freight revenue and the 27 per cent higher passenger revenue that prevailed during the peak traffic of the war continued, the railways might have

The year just closed was somewhat of a paradox so far as freight traffic results are concerned. Although railway freight traffic was twice diminished by coal strikes and all rail service was halted by a two-day rail strike, the total traffic handled set new records for a peace-time year. Despite this heavy movement, railway operations were generally unprofitable, and a general rate increase averaging more than 17 per cent was granted by

the Interstate Commerce Commission, to become effective January 1, 1947. Although total traffic was less than during the war, general car shortages prevailed most of the year. Many indices of railway efficiency declined during 1946, but most indicated far better railway performance than before the war. A hopeful note was the restoration, and in many cases betterment, of pre-war freight schedules on most lines.

* Latest periods for which figures are available.

made a fairly good financial showing on the basis of pre-war rates, in spite of increased labor and material costs. But, when the expected post-war traffic decline to peacetime levels occurred while costs continued to mount, it was inevitable that the roads would be forced to ask for an increase in rates.

The Rate Case

Although many railway officers favored earlier action, it was not until the pattern of 1946 railway wage increases was supposedly set by arbitration and emergency-board awards of 16 cents an hour added to existing pay rates, that the railways finally went to the Interstate Commerce Commission with a petition for increased freight and sustained passenger rates. (The settlement in May of the strike of members of the B. of R. T. and B. of L. E. resulted in a further wage increase to employees of 2½ cents an hour.) A general increase in freight rates of 25 per cent was requested with certain exceptions and limitations which reduced the overall average increase to about 20.7 per cent.

In their petition the carriers asked for a decision by May 15. On June 20, the I. C. C. authorized a temporary general rate increase of 6 per cent in all except Official Classification territory, where an additional 5 per cent increase was ordered, or a total general increase of slightly more than 11 per cent in that section. When full account of the exceptions to the general increase is taken the average for the country as a whole was an increase in freight rates of about 6.5 per cent. These rates became effective July 1, and marked the first general rate increase the railways had received since 1942, which increase had been under suspension since May 15, 1943.

The rate increases authorized in the June 20 decision were of an interim nature and hearings continued throughout the summer in Chicago, Buffalo, N. Y., Atlanta, Ga., Houston, Tex., and Salt Lake City, Utah, and were concluded in Washington, D. C., in September. As might be expected, the June 20 decision pleased no one. Particularly disturbed were shippers located in Official territory, who contended that the "double" increase ordered for that section was discriminatory. Likewise, owing to the prevalence of combination rates for much of the interterritorial traffic, shippers in other territories were alarmed by the effects of the increase, as they, too, saw normal competitive relationships upset by the decision, which increased combination rates by means of the "double" increase applying on the Official territory factor more than it increased the through rates enjoyed by many of their competitors.

The railways, of course, were not pleased with a decision by a government body which gave them only about one-third the amount they estimated they required, while almost simultaneously, President Truman, by his handling of the wage dispute, was forcing them to grant further wage increases adding more than \$100 million annually to the amounts already held reasonable by two arbitration boards and an emergency board. Adding to the railways' dissatisfaction with the June 20 decision was their knowledge that, although the wage awards were retroactive, the freight rate increases could not be, so that, even if they should eventually be given all they sought, they could never regain the revenue they had lost while the I. C. C. considered their plea.

Significantly, during the entire rate hearing, both before and after the June 20 decision, there was general agreement among most shippers that the railways were entitled to increased freight rates. Most of the shipper opposition centered on the amount of the increase, or was of the "let-George-pay-it" variety, which admitted the need but pleaded individual hardships. As could be expected, after the June 20 decision was made, much of the testimony was devoted to efforts to prevent the adoption of unequal territorial increases in the final decision. Support for the railroads' case was received from the motor and water carrier industries, which also endeavored to persuade the commission to order the railroads to discontinue what they termed "depressed" rates which the railroads had made effective in order to retain, or in some cases to regain, competitive traffic. As has been usual in recent years, the government itself, through such agencies as the Department of Agriculture and the Office of Price Administration, was the most vociferous opponent of the carriers' application, notwithstanding the fact that the policies of other government agencies, more than any other combination of things and events, were primarily responsible for the increased labor and material costs which made it necessary for the railways to seek to increase their rates.

Finally, on December 6, 1946, more than seven months after the application had been filed, the I. C. C. reached a decision granting the carriers freight rate increases to become effective January 1, 1947, averaging 17.6 per cent above the rates in effect last June, before the emergency increases were granted. The I. C. C. estimated that its December 6 order would increase rates in Official territory by 17.9 per cent and elsewhere, by 17.4 per cent, thus virtually ending the separate treatment accorded Official territory in the June 20 decision, and that the increased

revenue to the railways will amount to about \$1 billion annually.

As the year ended, the rail carriers were involved in another major freight rate battle, one initiated by the War Shipping Administration and the U. S. Maritime Commission last March. These bodies petitioned the I. C. C. for a general investigation of rail rates on coast-to-coast and coastwise traffic, which they charge are "subnormal" and "unjust and unreasonable." The private ship operators contend that they now find it impossible to operate profitably at pre-war rates. Unlike the railways, which faced governmental opposition to their efforts to increase rates, the ship operators have two government bodies which, recognizing the impossibility of profitable operations with pre-war rates and post-war costs, are taking active steps to increase the rates the operators are permitted to charge. Further, as part of this campaign, they seek to force the railways to forego a profitable long-haul traffic by having the rail rates raised to such a point that the ship operators can undercut them. This action they term "preserving the inherent advantages" of water transportation.

The outstanding operating feature of railway freight traffic in 1946 was, of course, the almost constant shortage of cars, a condition many non-railroaders found hard to understand in view of the fact that the roads carried a heavier traffic volume during the war with only sporadic localized car shortages. Primarily, last year's car shortages were of box and coal cars of various types, although demands for other classes of equipment, notably stock and refrigerator cars, exceeded the supply for certain periods.

Car Shortages

Box car shortages appear to have been the result of unprecedented demands for this type of equipment for both carload and l. c. l. shipments. Currently, and for some time past, carload shipments for which box cars are required have been running about 10 per cent ahead of last year, while l. c. l. loadings are up about 15 per cent.

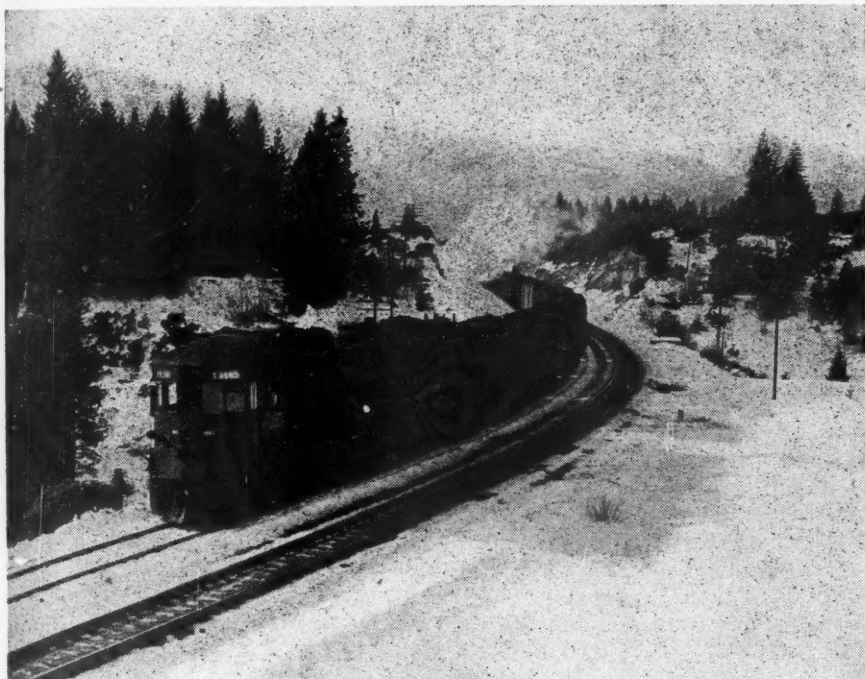
The situation with respect to coal cars has been the result of the efforts of the coal mining industry to recover from the effects of the prolonged coal strike of last spring. Although there were many complaints because of the railways' inability to furnish at all times coal cars as they were needed at the mines, the railways can hardly be said to have hindered coal production seriously, for, at the end of the year's first big coal strike in June, coal loadings were 18 per cent below those of 1945, while as of November 2, the year's coal loadings were only 1.7 per cent be-

low those of 1945. In effect, in four months the coal industry, with the help of the railroads, had virtually overcome the tonnage losses of the spring coal strike.

The shortages of refrigerator cars, while serious at times, showed a general tendency to decline throughout the year, due, in part, to deliveries of new cars. Stock car shortages were extremely sporadic, but were quite large when they occurred. There was a serious deficiency in the supply of these cars during the brief period in July and August when the lapse of O. P. A. controls on meat caused a flood of livestock to markets. Again in October, when O.



Diesel-electric locomotives aided the railways to speed freight to markets



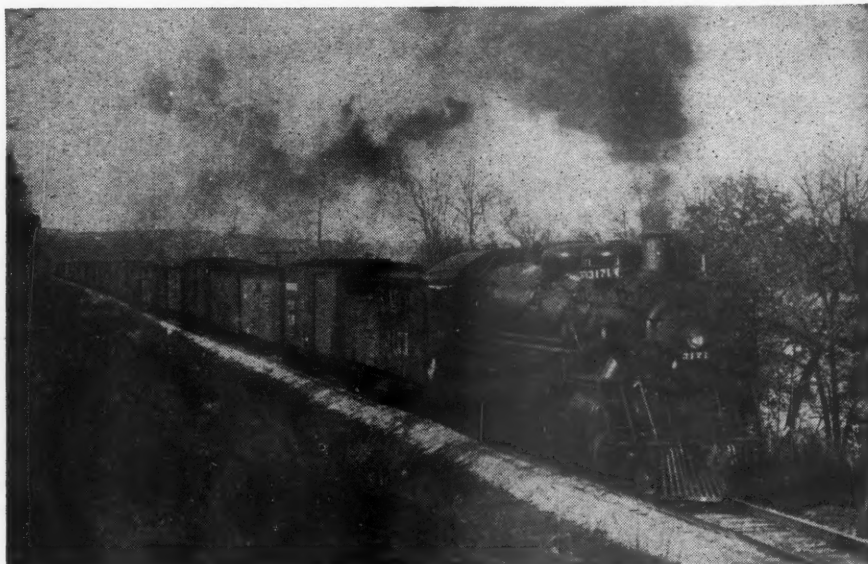
Seventh-morning delivery between Chicago and Pacific Coast cities was restored during 1946

Freight schedules from St. Louis, Mo., and Chicago to Texas points were cut 24 hr. under pre-war levels

Santa Fe photos

P. A. meat controls were withdrawn permanently, there was another flood of livestock caused by the producers' attempts to sell on a peak market while "famine" prices were available. Settling of livestock prices to a more normal basis, which followed within a few weeks, ended the flood, and restored to the railways a more steady volume of livestock and fresh meat traffic, which O. P. A. pricing policies had dried up. Illustrating the severity of the sudden flow of livestock to market, the railways loaded 64,292 cars of stock during the two weeks ended October 26, although their ownership of serviceable stock cars at that time was only 50,393 cars.

Another factor contributing to car shortages during the year was the re-



sumption of the five-day week by industry, which inevitably delays the loading and unloading of cars on hand at loading points over a full two-day week-end. Also, average hauls were somewhat shorter and average car loads somewhat lighter than during 1945, which had the effect of decreasing the usefulness of freight cars in service and increasing the demands for them.

Decreased Car Ownership

Finally, there is the inescapable fact that the carriers owned fewer cars in 1946 than in 1945 and that, of those owned, a higher percentage were unserviceable. At the close of August, 1946, U. S. railways owned 1,760,645 cars compared with 1,782,362 cars owned at the end of August, 1945. Of these, 4.1 per cent of those owned in 1946 were unserviceable on that date, contrasted with 3.2 per cent in 1945. While it may seem strange that, in the face of car shortages, the railways owned fewer cars in 1946 than in 1945, the answer is fairly simple—intensive utilization and accelerated wear during the war, combined with the refusal of government agencies to authorize adequate replacements. Exactly the same reasons can be given for the increase in the proportion of bad order cars. The railroads, through the Association of American Railroads, and the Office of Defense Transportation, through its director J. Monroe Johnson, have been tireless in their pleas to the agencies which allocate steel and other necessary materials, to provide more materials for railway car construction and repair. They have had some success, but it has not been enough, and even now many roads are unable to secure allocations of enough materials to repair their existing equipment.

The first complete peace-time year since 1940 shows that many railroad operations are now better conducted than ever before, while others have suffered somewhat. Net ton-miles per train-hour (average for nine months) were estimated at 17,099, down slightly when compared with the 17,766 recorded in 1945 and the 17,728 recorded in 1944, but substantially higher than in any other year on record. The number of cars per train during this 1946 period was 51.8, slightly under the war years, but somewhat higher than the 50.3 car average in 1941. Likewise, net tons per train, 1,077 during the first nine months of the year, was somewhat under the records of 1,147 for 1945, 1,142 for 1944 and 1,111 for 1943, but was higher than for any other year and marks the first peace-time year that net tons per train ever rose above 1,000. (1942 was the first year this ever occurred. The record for the first nine months of that year was 1,021 net tons per train.)

Records of freight car performance also indicated some loss of efficiency with the ending of the war, but still show substantial gains over previous peace-time years. Net ton-miles per loaded car-mile during the first nine months of the year averaged 31.2, compared with 32.4 in 1945, 32.8 in 1944, 33.5 in 1943 (all-time high), 31.4 in 1942, and 28.3 in 1941 (pre-war peak). Car-miles per car-day during the same period were 41.9 in 1946, 48.3 in 1945, 49.6 in 1944 (high), 48.6 in 1943, 46.1 in 1942, and 39.9 in 1941 (pre-war peak). Net ton-miles per car-day were 871 in 1946, 1,047 in 1945, 1,067 in 1944 (high), 1,036 in 1943, 906 in 1942, and 722 in 1941 (pre-war high). Per cent loaded to total car-miles was 66.5 in 1946, 67.0 in 1945, 65.4 in 1944, 63.7 in 1943, 62.7 in 1942 and 63.9 in 1941. Examination of past performance in this respect indicates that this was not an unusual performance, as the average has remained close to 65 per cent since 1920, when 69.5 per cent of all car-miles were accounted for by loaded cars.

The year 1946 saw considerable improvement in railway freight service, although pre-war standards have not yet been restored in every case. Statistical evidence of this condition is found in the record of average train speed which, for the first nine months of the year was 16.1 m.p.h., compared with 15.7 m.p.h. in 1945 and 1944, 15.5 m.p.h. in 1943 (war-time low) and 16 m.p.h. in 1942. Although the average freight train speed of last year represents a considerable improvement over the average of the war years, it is still quite a bit under the 16.8 m.p.h. average of 1939, the best years of record.

Freight service improvements, of course, were nation-wide. On the Pacific coast the Southern Pacific restored its famous fleet of "Overnights," operating out of San Francisco and Los Angeles, while sixth-morning deliveries between St. Louis and California points and seventh-morning schedules between Chicago and the Pacific coast were restored. During December, 1945, the Missouri-Kansas-Texas inaugurated its "Comet" freight service between St. Louis, Mo., and Texas points, leaving St. Louis at 8 p.m. daily, with arrival in Fort Worth early the next evening and in Houston at 7 a. m. on the second day.

This service, which is 48 hr. faster than war-time schedules, is also 24 hr. faster than pre-war schedules, and, when combined with the normal Chicago-St. Louis service of approximately 12 hr., cuts the Chicago-Texas schedule 24 hr. under pre-war time as well. Shortly thereafter other Chicago and St. Louis lines serving Texas published similar schedules.

Another road to revise its freight train operations drastically is the Chicago,

Indianapolis & Louisville, which, during the war, had operated all of its freight trains on a "tonnage" basis. During the summer of 1946 the Monon changed over to 100 per cent "time" freight operation and now operates a 10-hr. freight train in each direction between Hammond, Ind., (its Chicago terminal) and Louisville, Ky., some 300 miles.

In the East, the New York Central and the Delaware, Lackawanna & Western each inaugurated overnight merchandise freight service between New York and Buffalo, N. Y., a service that had been discontinued during the war. The N. Y. C. "Pacemaker" freight train is operated with special equipment, distinctively painted, and includes cars for movement to such N. Y. C. western points as Cleveland, Ohio, Detroit, Mich., Chicago, Indianapolis, Ind., and St. Louis, Mo.

These, of course, are only a few of the more spectacular freight service improvements that have occurred during the year. Other roads have made similar improvements in their services; and all will continue to do so in 1947.

In the face of a general decline of freight traffic during the year, l.c.l. traffic increased even above the war years. During October and November, loadings of this class of traffic averaged nearly 130,000 cars a week, compared with 115,000 in 1945 and 110,000 in 1944.

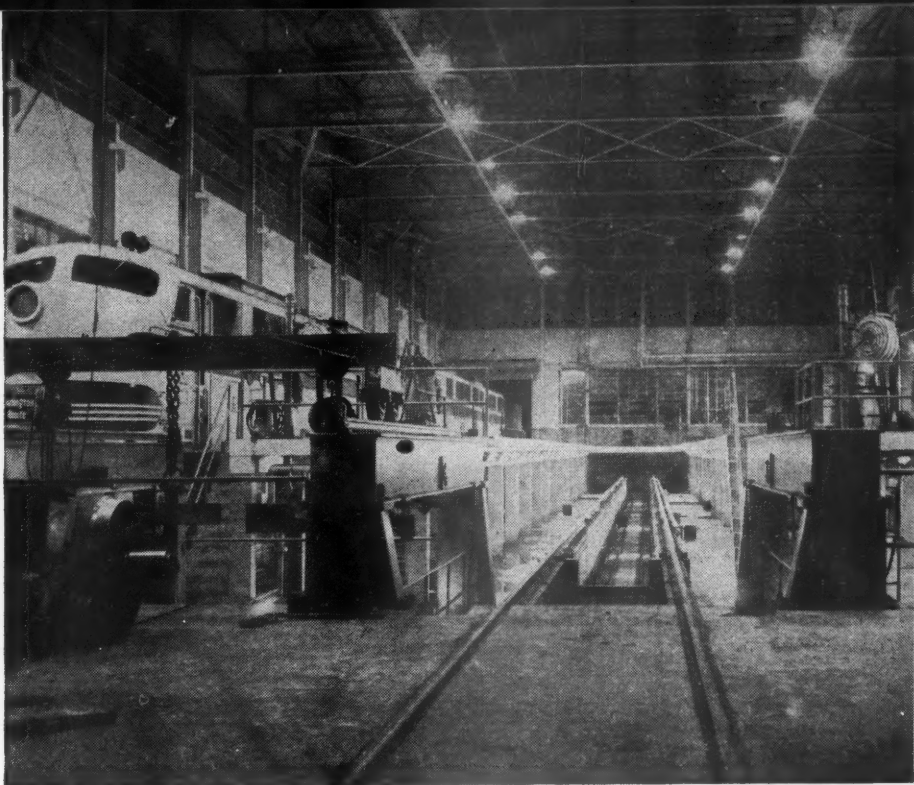
L. c. l. Favored

The combination of this heavy traffic with continuing shortages of freight-house labor in many of the larger cities, heavy loading of individual cars, inability to deliver freight to consignees on both Saturday and Sunday, strikes of local draymen, and the fact that during the depression many railroads, in the belief that l.c.l. traffic had sunk permanently to the low levels of the 'Thirties, had accordingly retired the then surplus facilities, brought about unprecedented freighthouse congestion. At various times during the year each of the freight stations in the New York area was under embargo, and at some periods all were. Similar conditions prevailed in other eastern cities, and in Chicago and a limited number of other mid-western cities.

Most roads are now endeavoring to improve their l.c.l. facilities to permit the continued handling of current volume of merchandise traffic without the delays encountered during the past year. It now appears that there has been a reversal of the depression-born defeatist attitude toward l.c.l. traffic, and most roads are now actively developing programs to expedite the movement of this type of freight and are assiduously promoting its movement.

Electrical Applications Increase Rapidly

By **ALFRED G. OEHLER**
Electrical Editor



The Burlington's Diesel service shop at Denver, Colo., an outstanding example of good lighting

Once looked upon as an accessory, electrical equipment is now one of the major requirements of railroad operation in shops, on locomotives and on cars

THE cessation of the war has had a triple impact on the application of electrical equipment in railroad service. First, the problem of getting along with an entirely inadequate amount of material came to an abrupt resolution. This was followed by the need for taking care of deferred maintenance and the replacing of inferior substitutes which had to be used during hostilities. Third, normal developments of electrical equipment and devices were enormously increased by the stimulus of war and many new things were produced which have railroad application. Some of these developments have considerably increased the complexity of such things as passenger car accessories, Diesel-electric locomotive control, machine tool drives, etc., but first-class electrical equipment is highly dependable and its use is serving materially to improve equipment performance.

Diesel-Electric Locomotives

Several new designs of road and switching Diesel-electric locomotives have been introduced to the railroads. Generally, they are characterized by increased horsepower, new traction motor controls, better cooling, improved dynamic braking, and one builder has

Diesel locomotives now represent a major application of electrical equipment, requiring new types of maintenance facilities with which most roads are only partially familiar. One electrification is discontinued but overall trend in use of electric locomotives is upward. Improvements to passenger service require more power, many auxiliary devices and intricate control equipment. Power for train communication is a new problem which involves locomotives, cabooses and wayside sources.

departed from the use of the swivel driving truck. New insulating materials and new designs of generators and motors are serving to reduce failures and simplify maintenance.

Diesel-electric locomotives, during the first eight months of 1946, accounted for 12.1 per cent of the freight service gross ton-miles, 20.4 per cent of the passenger car-miles and 32.9 per cent of the switching-hours, according to calculations of the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission. These figures are contrasted with 0.1, 6.7, and

10.2 per cent respectively for 1940. While it is generally conceded that steam locomotives will continue to haul a large percentage of traffic for many years to come, it is equally apparent that the use of Diesel-electrics is still a long way from the saturation point.

In a report presented before the 1946 annual meeting of the American Society of Mechanical Engineers, J. P. Morris, general assistant, mechanical department, of the Atchison, Topeka & Santa Fe, stated that on his road Diesel engines required 54.64 per cent of the total money spent for repairs, the electrical equipment required 23.96 per cent and other parts of the locomotive required 21.40 per cent. The Santa Fe has had a lot of experience with Diesel-electric locomotives and has excellent maintenance facilities. Its management would probably agree, however, that there is greater possibility of reducing the electrical maintenance item than that of the Diesel engine. The reason is that railroad forces are more accustomed and better equipped generally for mechanical than for electrical maintenance, and if other roads will check their costs they probably will be impressed with the fact that they are amenable to reduction of the electrical percentage.

One railroad electrification has been

made unnecessary. Satisfactory operation of Diesel-electric locomotives on the Boston & Maine's Fitchburg division, which includes the five-mile Hoosac tunnel with its recently improved ventilation, has made it possible to eliminate the electrification through the tunnel. This installation was made to rectify an operating condition which was extremely hazardous with steam locomotives. It is not representative of the major electrification requirement for railroads in the United States which is that of operating heavy traffic lines.

The demise of the Boston & Maine electrification is physically much more than offset by the building of locomotives for the Virginian and the Great Northern. Four 6,800-hp., motor-generator type, 11,000-volt, a.c. locomotives for the Virginian are nearing completion. These locomotives will have a million pounds on the 16 driving axles and will have a top speed of 45 m.p.h. Also under construction are two electric locomotives for both freight and passenger use on the Cascade tunnel section of the Great Northern. They will be single-cab locomotives weighing 720,000 lb. They also are 11,000-volt, motor-generator type units, will develop 5,000 hp. and have a top speed of 65 m.p.h.

The greatest expansion in railroad electrification at present, and probably for the next few years, will be in South America and Europe, where fuels for steam and Diesel locomotives are scarce and high priced. Large shipments of electric locomotives are in progress from the United States to the Paulista Railway, the Sorocabana Railway and the Central Railway, all in Brazil. These include 48 road locomotives and a number of switchers.

Passenger Car Equipment

Passenger car electrical requirements have grown to a point at which, for many cars, a 20-kw. axle-generator is no longer adequate and sizes are being stepped up to 25, 30 and 35 kw. In some instances two generators are being applied. In the case of a 15-car train this represents a load of 500 or more horsepower on the locomotive, and the case for head-end power is again being agitated. This would be the simplest and best solution to the train power problem and would relieve the locomotive of all parasite load except that required to haul the power car. Unfortunately, it presents some problems when it is necessary to change the train make-up, and most difficult is the fact that type of power, and arrangement of connectors, would have to be uniform if cars are to be used in interchange. This appears to be an insuperable problem, and railroads are apparently going to continue, for the most part, with cars

which relatively are independent units.

About 10 per cent of railway and Pullman passenger cars now in service have air compressors driven by propane-burning engines and a part of these also employ similar engines for generating the necessary electrical power. A number of experiments have been and are being made with Diesel-electric generating sets which supply all of a car's requirements, including heating, air conditioning, lighting and various other items. Mechanical refrigeration for dining cars is evidently going to find wide application.

Air conditioning and heating controls have been developed and perfected to a point that will produce comfort conditions definitely superior to those possible in previously built cars. Better air filters are available and these include electrostatic filters which will remove dirt particles as small as those in tobacco smoke and will deliver sterile air to the car. Sterilamps are available which will dispose of air-borne bacteria and which may also be used effectively to assure the purity of drinking water. Car odors can definitely be eliminated by the use of activated carbon. This permits a reduction of the rate of air change in the car.

In coach lighting, there are two schools of thought, those who feel that fluorescent lighting is a natural for all car lighting, and those who think light should be selective for individual seats. The latter method requires the use of incandescent lamps. Generally the tendency is toward fluorescent, and since such lamps must have 60 or 110 volts for operation, they are influencing the selection of power supply systems.

There is a definite trend toward the use of 60 and 110-volt systems for several reasons. One is the lamps, as referred to; another is the reduction of the large sizes of wire and cable used with 30 volts, and a third is that the 110-volt system permits the use of standard electrical equipment. Another step in this direction is the installation of motor-alternators and synchronous inverters to supply three-phase alternating current power. This permits the use of small, relatively inexpensive three-phase motors and of standard a.c. fluorescent lamps and auxiliaries.

The railroads would like to use sealed type compressors for air conditioning with built-in motors, but the manufacturers state that, with the high temperatures experienced with air-cooled compressors as used on the railroads, there is a rapid deterioration of motor insulation which makes the use of the required 8-ton units impracticable.

Railroad shop lighting is undergoing a metamorphosis. This is particularly true in Diesel shops where the use of light colored interiors, including so-

called dynamic colors, is possible. Good lighting is also being extended to steam locomotive erecting and machine shops.

The best lighted Diesel shops, with 15 to 30 footcandles on the working plane, use high-intensity mercury lighting and fluorescent lighting with a small amount of incandescent lighting for color improvement and protective purposes.

No one has yet evolved an adequate means of lighting an enginehouse, primarily because any system installed is never adequately maintained. It is hoped that some fluorescent systems now being tried may prove to be satisfactory. British railroads have developed a truck which carries tools and which is equipped with fluorescent lights.

Power for Train Communication

The advent of train communication has introduced some new power supply requirements. On steam locomotives it can be accomplished by using the existing headlight generator if it is large enough. If not, a second unit or larger one may be applied. If desired, a generator may be used which furnishes both a.c. and d.c. power. All road Diesel-electric locomotives have a sufficient amount of auxiliary power available. On some switchers, the margin is narrow, but it is expected that power requirements can be kept within existing limits.

Cabooses present the major problem. The power unit will in most cases provide some light as well as communication power and railroad management has long been apprehensive that other demands will be imposed on caboose power systems. Both axle-driven and engine-driven generators are being used, and it appears that some kind of standby power at the caboose track may be desirable in either case.

Fair Field, No Favor

Competition is certainly the stimulus that has created our economic system and without it our industrial concerns would become stagnant with no incentive to produce bigger and better things for less and less money for the American people. The railroads are not averse to, nor do they fear, competition. However, if the railroads are to survive, if they are to provide the luxurious passenger equipment and fast service demanded by the people, if they are to continue to serve the country in peace as in war, some thought and serious study must be given the problem of the governmental favors now being so generously bestowed upon competing forms of transportation.

—The South Pittsburg (Tenn.) Hustler.



Above: Typical signal in the Canadian Rockies on the Canadian Pacific which installed automatic block on 289 miles in 1946. Right: The Milwaukee installed controlled automatic block on an engine district in Dakota

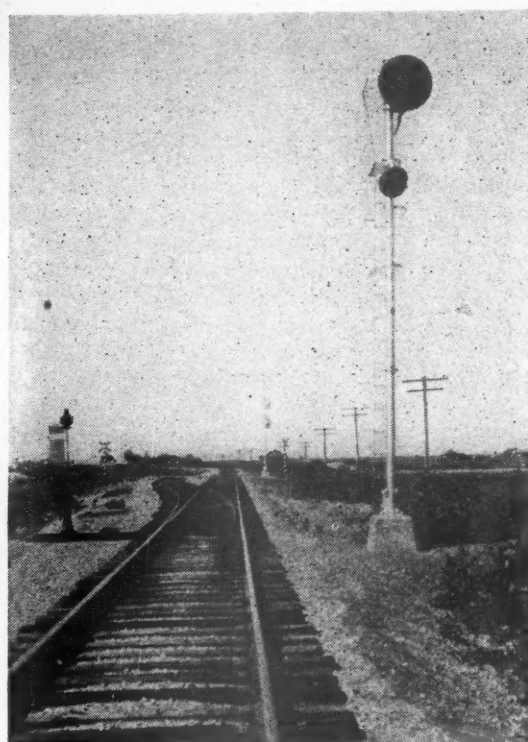
Extensive programs of signaling construction are required, not only to replace antiquated equipment, but also to install new systems of signaling, such as cab signals, car retarders, centralized traffic control, highway crossing protection and consolidated interlockings. These signaling facilities help the railroads to reduce overall time of trains and otherwise to cut operating expenses by the more efficient utilization of locomotives, cars and tracks. For these reasons, signaling pays its own way, and, therefore, construction in this field will continue in large volume.

Much Ahead in Modern Signaling

Construction in 1946 was hampered by shortages but many developments point to heavy programs, especially train operation by signal indication on new mileages, for 1947

By JOHN H. DUNN

Signal and Communications Editor

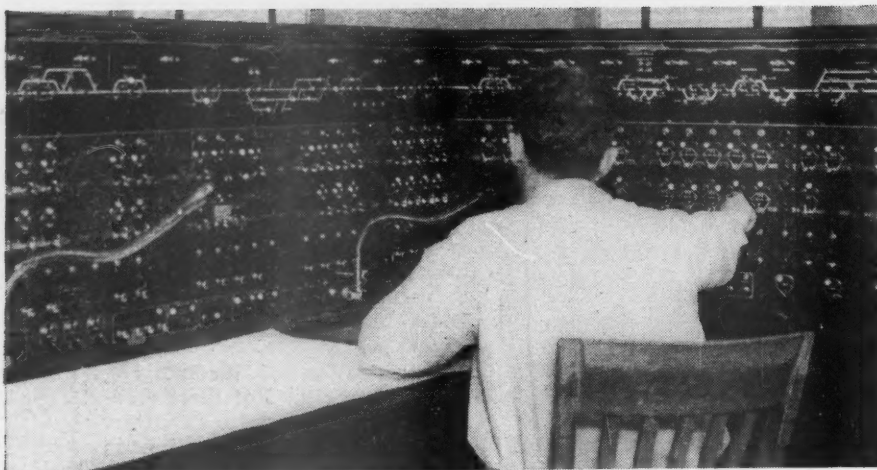


ALTHOUGH a large volume of signal construction was completed during 1946, the year will be remembered with regard to signaling, not so much for what occurred but rather for what was about to happen any time, but did not. Numerous delays on many of the projects authorized or under way may be ascribed to shortages of trained men or the scarcity of a few items of material. For example, magnet wire was difficult to secure in the proper sizes and quantities, and this shortage of a very small item limited the production of relays, signals and switch machines throughout 1946. In spite of these and other handicaps, a considerable number of projects were

carried to completion as listed in the statistical article elsewhere in this issue. For the most part, however, the larger of these projects were planned during the war as facilities necessary to victory. Now these installations, without any conversion problems, are being utilized to expedite peace-time traffic.

As applying to commitments on future projects, there was, in 1946, a time lag to permit a logical change from war-time to peace-time thinking. In these respects the problems were not only with reference to the systems of signaling to be installed to meet the requirement for changing circumstances in train operations, but also to adopt modern types of

apparatus and construction methods. Discussion elsewhere in this issue points to the increases in population and general business activities which will call for rail transportation in large volume for years to come, regardless of the air lines, highways and waterways. This competition cannot be overlooked, but it is certain to have the beneficial effect of requiring the railroads to improve their facilities so they can render fast, reliable train service, at passenger fares and freight rates that will be attractive. Modern signaling has an important place in such a program by helping to reduce the overall time of trains, and to reduce operating expenses. Thus it is that sig-



This C. T. C. machine on the Union Pacific at Pocatello, Idaho, controls a 156-mile territory completed in 1946

nalizing construction pays its own way and, therefore, is certain to continue in large volume. An important consideration also is that the railroads, when planning either the modernization or new construction of signaling facilities, must be governed not only by their needs in safeguarding and expediting train operations but also by the requirements of the Interstate Commerce Commission applying to signaling. More will be said later on each of these factors.

New Work of First Consideration

Of first importance, with reference to the installation of signaling of lines not now so equipped, is the proceeding of the Interstate Commerce Commission, instituted on May 20, 1946, requiring the railroads to show cause why the commission should not issue an order requiring any railroad "to install block signal system, interlocking, automatic train stop, train control and/or cab signal devices, and/or other similar appliances, methods and systems intended to promote the safety of railroad opera-

tion, upon the whole or any part of its railroad on which any train is operated at a speed of 50 m.p.h. or more." The form of the questionnaire issued by the commission, and statements made by the presiding commissioner at the hearing, make it clear that the inquiry is directed to mileage where maximum authorized speeds are 50 m.p.h. or more for freight trains, and 60 m.p.h. or more for passenger trains.

At the hearing in Cincinnati, Ohio, on October 2 and 3, and in their brief filed December 2, the railroads contended that rather than issue a blanket order applying to all roads, the commission should continue its past practice of making an individual investigation, and of issuing a separate order applying to each specific railroad.

Mileage Involved

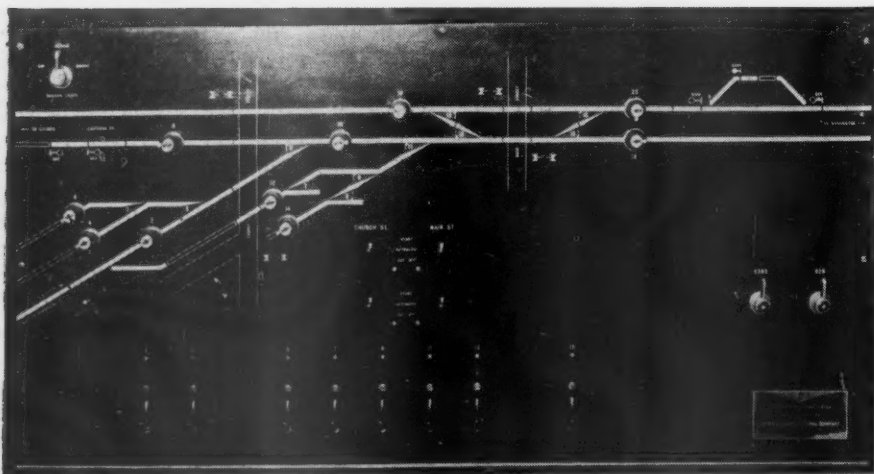
Up to the close of the year no decision or order had been issued on this matter by the commission, but regardless of whether a blanket order, individual orders, or no orders at all are

issued, an enormous mileage of new signaling will be installed simply because of the need for protection and the necessity for expediting trains, with the realization that the new signaling will pay for itself in a few years. An approximate measure of the mileage that more than likely will be signaled in the next five to seven years is indicated by data concerning train speeds in different territories presented by the railroads at the hearing on October 2. On United States roads, and applying to territories where train movements are authorized by timetable and train orders without automatic block signal protection, there are 9,579 miles of track on which freight trains are operated at 50 m.p.h. or more, and 20,171 miles on which passenger trains are operated at 60 m.p.h. or more. For the most part the mileage quoted for freight trains is duplicated in that for passenger trains and, therefore, only the 20,171 miles need be considered.

Applying to territory where manual block is now in service, passenger trains are operated at speeds of 60 m.p.h. or more on 8,401 miles. Presumably this manual block would meet the commission's requirement for a "block signal system," but if strict compliance with absolute manual block rules is required, the trains would encounter too many delays, and operating expenses might be increased by requiring more open offices. Thus, for this discussion, a large percentage of the 8,401 miles of manual block may as well be added to the 20,171 miles of time-table and train-order territories, making a grand total of 28,572 miles.

In consideration of the speeds mentioned above, and in view of the fact that most all of the "medium" to "heavy" traffic lines have previously been signaled, it should be emphasized that most of the 28,572 miles which presumably are to be signaled, are on extended sections of single-track routes which handle important fast through trains, but in a volume which can be classed as ranging from "medium" to "moderate", as, for example, 15 to 10 or 8 trains daily. As applying to such circumstances, almost everyone concerned agrees that signaling, including track circuits throughout, should be installed to afford protection against collisions, to detect broken rails, and to check the position of switches, as well as to detect cars fouling the main track at turnouts. Also, a fact which has been proved in numerous instances is that while installing a system including track circuits throughout, it is most logical to provide for train operation by signal indication under control from a central office, thus dispensing with the delays to trains which are inevitable under the antiquated timetable and train-order practice.

This new all-relay interlocking machine on the Southern at Orange, Va., is typical of modern construction



On single-track lines handling any considerable volume of important high-speed through traffic, experience of numerous roads has proved that the installation of complete centralized traffic control, including power switch machines, is the best policy in the long run. Several projects, each including a complete engine district of approximately 100 miles, are now in service on such roads as the Denver & Rio Grande Western, the Union Pacific, the Southern Pacific, the Burlington, the Rock Island, the Milwaukee, the Seaboard and the Louisville & Nashville.

However, with respect to a considerable proportion of the 28,572 miles under discussion, a problem arises when determining the system of signaling to be installed on a line which handles only a moderate volume of traffic, say, for example, two through passenger and a local passenger train each way daily, and about three through freights and a local each way daily, totaling 12 to 14 trains. An excellent solution of such a problem was effected on the 107 miles of the Louisville & Nashville between Sinks, Ky., and Lebanon Junction, as explained in an article in the *Railway Age* of December 7, 1946. In brief, the installation of complete C. T. C. in this instance, including power switches, instead of conventional automatic block, was made because the costs were reduced by eliminating about half the sidings not needed with C. T. C., and by reducing the number of intermediate signals to those actually required by the traffic to be handled.

In case other railroads are not sure that C. T. C. will permit the removal of half the old sidings, they can do as the Rock Island did on a project between Herington, Kan., and El Reno, Okla., i. e., install power switches and C. T. C.-controlled signals at every other siding, about 10 to 11 miles apart, and leave the intervening sidings in place with the old hand-throw stands in service. If future peaks of traffic, such as a wheat movement, can be handled with C. T. C. power sidings 10 miles apart, then the other old sidings can be retired.

Under circumstances where the continued use of hand-thrown switches at sidings is practicable, some roads have installed systems for train operation by signal indication under the control of dispatchers. For example, the Wabash developed and installed "manual block-remote control" as explained in the *Railway Age* in July, 1945. An installation which is somewhat similar, but termed "controlled block signal system," is now under way on 92 miles of single track on the Western Pacific between Stockton, Cal., and Oakland.

Using a somewhat different arrangement of signals at sidings, the Milwaukee has developed and installed "controlled



The Spokane, Portland & Seattle included rock-slide-detector fences in an automatic block signal project

automatic block." On an engine district of about 100 miles between Aberdeen, S. D., and Mobridge, on which there was previously no signaling, the problem was to install a signal system best adapted to a traffic of about two through passenger trains and a local passenger train each way daily, and three or four through freights each way. This controlled automatic block system includes no intermediates except those required also as distant signals in approach to station-entering signals. At each pass-

ing track switch there is a conventional arrangement of signals, controlled by the dispatcher, to direct trains to (1) continue on the main track; (2) stop, operate the hand-thrown switch, and enter the siding; or (3) if on the siding, operate the hand-throw switch, pull out on the main track, close the switch, and depart for the next town. Also, on house tracks, signals are provided to direct trains to enter the main track.

Thus, all train movements are directed and authorized by signal indication, with-

The Louisville & Nashville cut costs of C. T. C. by removing half the old sidings and using a minimum of intermediate signals



out the use of train orders. The track circuits are the coded type, thus eliminating line control wires, and the track circuits between towns are the new normally de-energized type, which permit the use of primary battery, thereby obviating the installation of line wires for a.c. distribution. The dispatcher's C. T. C. code control circuit was superimposed on the existing line wires used also for the telephone train dispatching. Thus by perseverance and skillful adaptation of modern equipment and construction practices, the Milwaukee held down the costs of this system for directing train movements by signals without the use of train orders. The increase in cost over a conventional automatic block can be justified by train time saved, and by reduction in operating expenses because of fewer open offices.

These observations, for the most part, can be applied to the installations on the Wabash and the Western Pacific, as well as, in certain respects, on some portions of three projects totaling 600 miles now being planned on the Seaboard. On these latter projects one machine at Savannah, Ga., will control 245 miles between that point and Hamlet, N. C. A machine at Tampa, Fla., will control 66.5 miles between Valrico, Fla., and Coleman, and a third machine at Jacksonville, Fla., will control 274 miles between Coleman and Miami. No track-circuit-controlled signaling was in service on this 600 miles.

Thus these railroads have demonstrated that signaling, including means for authorizing train movements by signal indications, can be planned to meet the requirement of almost any volume of traffic and operating conditions. Therefore, as applying to lines not now signaled and on which the proposed I.C.C. order may be effective, a logical decision would be to install a system including means for authorizing train movements by signal indication, rather than conventional automatic block, which would afford protection but would continue most of the delays now involved in the antiquated timetable and train-order system.

On Mileage Now Signaled

The foregoing discussion has applied primarily to territories not now equipped with track-circuit-controlled signaling, whereas attention is now directed to the 101,519 miles of track on which such signaling is in service. Much of this latter signaling has been in use for many years, and, therefore, is worn or obsolescent to the degree that it cannot be maintained and operated economically. For example, several railroads, such as the Norfolk & Western, Boston & Maine, New York Central, and Atlantic Coast Line, have extensive reconstruction pro-

grams under way involving the replacement of semaphore signals with modern light signals. In some instances, as for example on 125 miles of double track between Richmond, Va., and Rocky Mount, N. C., on the Atlantic Coast Line, the projects involve the installation of modern coded track circuits and completely new control systems so that, except for reusing the existing rail bondings, the installations are practically new.

Some of these projects on single track include also the installation of centralized traffic control as, for example, on 81 miles of single track on the Nickel Plate between Arcadia, Ohio, and New Haven, Ind.

C. T. C. on Double Track

As applying to double track, some railroads are adding C.T.C. to operate trains by signal indication in both directions on both tracks. By means of cross-over layouts at intervals of 10 to 15 miles, fast trains can be diverted from one track to the other to run around slower trains. Thus, both tracks can be used in the direction of heavy traffic in peak periods, such as "inbound" in the morning and "outbound" in the evening. Such a system is now under construction on 75.6 miles of the Chicago & North Western between West Chicago, Ill., and Nelson.

Replace Old Interlockings

At the beginning of 1946 the railroads in the United States had 4,929 interlockings, of which 1,499 were electric, 419 electro-mechanical, 396 electro-pneumatic, 1,625 mechanical, 406 automatic and 522 remote control. No attendants are required for the operation of the automatic and remote-control plants, but levermen must be on duty constantly at practically all of the 3,939 other plants. Therefore, where old interlockings are in need of replacement, new signals and power switch machines can be installed and controlled remotely. For example, at a location near Chicago, three roads cross each other at three crossings less than a mile apart. Old mechanical plants in service at each of these crossings are to be replaced by new signals and switch machines, all of which will be controlled by one new panel-type interlocking machine. An important advantage is that train movements will be coordinated under the control of one man.

Many outlying mechanical interlockings can logically be replaced by power signals and switches controlled either automatically or remotely, and the remote control may be from the nearest open office or included in a centralized traffic control project. In general, therefore, the number of interlockings as

separate towers or offices gradually will be reduced. New equipment and construction work will be required in each instance, but the savings within a very few years will be more than the expenditures.

More Crossing Protection

In 1938 to 1940, inclusive, crossing protection was installed at an average of 1,000 highway-railroad grade crossings annually, but during the war years this type of construction was limited to those few crossings serving military camps or war industries. Furthermore, not much progress was made in 1946, protection being installed at only 798 crossings; therefore, a backlog of several thousand crossings has accumulated. These projects include not only new installations at crossings not previously protected, but also complete replacements of old installations.

Within recent years there has been increased preference for automatically-controlled short-arm gates at all crossings of two or more main tracks, as well as single tracks on which trains are operated at high speeds, 75 m.p.h. or more. The volume of highway traffic is, of course, a basic factor.

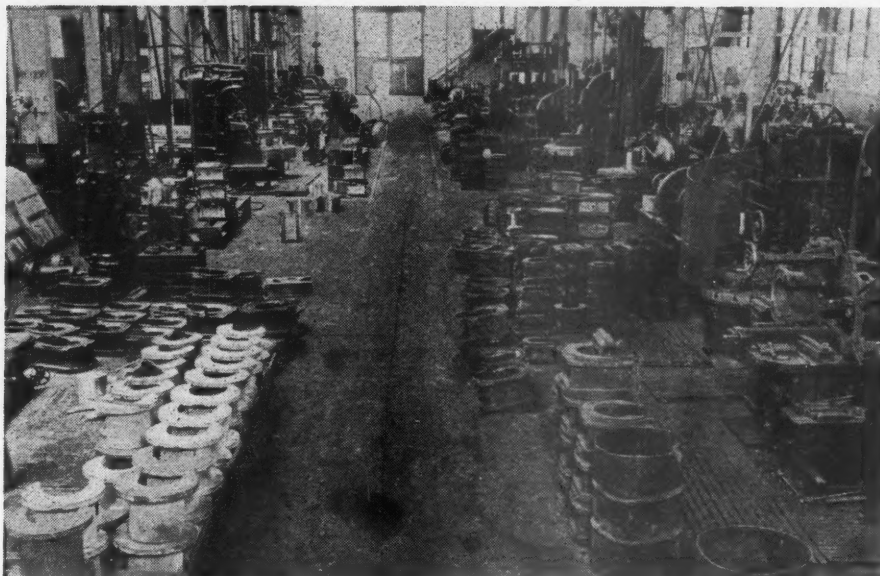
For many years the railroads bore the entire expense of installing and maintaining crossing protection, but within more recent years some states and the federal government have shared the construction costs of new projects. These programs were halted by the war, but should be renewed as soon as practicable, because it is an accepted fact that in ratio to the money spent, more lives are saved by installing protection than by expensive grade separation projects.

More Car Retarders Now

In many instances freight cars lose too much time in yards waiting to be classified, a condition which can be corrected in numerous instances by installing power switches and car retarders. As proved by projects in more than 45 yards, these signaling facilities permit operation without car riders and switchmen, reduce operating costs, increase the rate at which cars can be humped, and permit full-capacity operation in any kind of weather, so that incoming cars can be classified promptly.

In conclusion, there is every indication that the construction of new signaling and the modernization of existing signaling will continue at a high rate for a number of years, not only because the railroads need these facilities to get the most efficient results from their tracks, locomotives and cars, but also because, invariably, and within a very few years, modern signaling saves more than it costs.

Shop Tool Programs Going Ahead



By H. C. WILCOX
Associate Editor

SEVERAL factors combined, in the last half of 1946, to slow up the actual placing of orders by the railroads for machine tools and shop equipment. What started out to be a record buying year finished up by being a year in which buying was not as great in volume of orders as in 1945 but which still, from the standpoint of dollar volume, far exceeded most of the pre-war years since 1928. Those retarding factors which stood out most prominently were: (1) The great increase in operating expenses as a result of the wage increases and material cost increases without any compensatory increases in freight rates. Naturally, the prospect of poor financial statements resulted in a suspension of capital expenditure programs until the roads knew just where they stood. Recent decisions of the Interstate Commerce Commission have cleared up this matter of rates for the time being. (2) An unsettled policy with respect to shop rehabilitation programs on the part of many roads because of an inability to come to any decision with respect to the extent to which steam-locomotive repair facilities should be modernized. (3) The allocation of capital funds, by management, to those items of greatest need and on which the investment return was most favorable.

Probably foremost in the actual orders for machinery and other shop facilities, during 1946 were the many thousands of dollars worth of new tools badly needed by the roads for the modernization of locomotive and car wheel shops or for installation in new wheel shops. At the year's end, as has been the custom for the past 20 years, the *Railway Age* made a survey of the actual buying, by the railroads, of machine tools and shop equipment, and detailed re-

The survey of the buying of machine tools and shop equipment for the railroads during 1946 shows, through detailed reports from 71 roads representing 81 per cent of the route mileage of the United States, that, had it not been for the suspension of buying programs due to financial uncertainty, the year would probably have established a record. As it was, the orders for machine tools and other facilities for locomotive- and car-wheel shops exceeded orders for that type of equipment for many years. Diesel-electric locomotives, because of a parts replacement system of maintenance, are influencing the thinking on the whole subject of locomotive repairs to the extent that radical changes may be made in the methods and facilities used for this purpose.

ports from 71 roads representing 81 per cent of the route mileage of the United States show the predominance of wheel-shop machinery (representing in itself about two million dollars) and equipment for the many new Diesel-electric locomotive running- and general-repair shops that are now taking care of the rapidly growing fleets of this new type of power. Those who may be of the opinion that Diesel-electric locomotives can be maintained without extensive shop facilities should look over the long lists of items that enter into the construction of a shop for maintaining Diesel power.

That survey settled one question which has been disturbing many people in both

the railroad and the machine-tool industries for some time—the question of what the railroads would do about second-hand defense-plant equipment. After the last war some railroads acquired considerable second-hand machinery and their experience with that equipment was so unsatisfactory that even the passage of 25 years did not dim the record with the result that, in 1946, only five roads of the 71 reported the acquisition of just 51 units—mostly welding machines—having an estimated total value of about \$45,000. With a total shop-equipment market probably in excess of 10 million dollars in 1946 that would seem to establish the feeling of railroad mechanical men with respect to used machinery.

What to Do?

Those who sell machine tools and shop equipment to the railroads quite frequently are told that a road is not buying because of the uncertainty as to the type of locomotives that may be used on that road in the future. There are many railroad officers today who seem certain that their road has bought its last steam locomotive and that the facilities for maintaining steam power should no longer be the object of further improvements involving capital expenditures. If those roads happen to be small roads favorably situated with respect to fuel oil supply and cost and unfavorably situated with respect to solid fuel supply, quality and cost, such an appraisal of the type of power that they will have to maintain in the future may be entirely sound. As to the larger roads, it is not possible to overlook the cold fact that there are still 37,732 steam locomotives out of a total of 41,785 (3,312 being Diesel and 741

electric) on the railroads of this country that are going to have to be maintained for years to come.

While there are other contributing factors, part of the reason why the availability of this larger group of steam locomotives is, in many instances, so low and the repair cost so high has been procrastination in the matter of providing adequate shop and engine-house facilities over a period of years. The railroad industry, along with other old and established industries, has been guilty of continuing machine tools and shop equipment in service far beyond any reasonable economic life simply because, too often, of a lack of a definite program of modernization and the absence of a more realistic approach to the problems of shop engineering on the part of both mechanical men and manufacturers' representatives.

There are exceptions to any rule and, in the railroad industry, there are many progressive roads that have followed a well-planned program of keeping up their repair facilities both in the back-shop and enginehouse. It has often been said that a road which has plenty of money can afford to have well equipped efficient shops, with the best in machine tools and shop equipment, but it is more than a coincidence that those roads with plenty of money are the ones which have spent it most wisely with the full knowledge that the potential savings attributable to the use of up-to-date equipment will more than pay for the acquisition of such equipment.

There was a time when labor rates and the cost of materials required for locomotive and car repairs did not represent the amount of money involved today. When labor rates were lower and materials less expensive there may have been some justification for hesitancy in the replacement of shop equipment but at today's material costs and wage rates every shop operation of any magnitude should be thoroughly investigated to determine whether or not it may be performed more economically.

To Buy or Build?

Too often, over a period of years, those who are responsible for the maintenance of railway equipment have lost sight of the primary purpose of a railroad, namely, to supply transportation. Many of the shops that are in existence today were designed, built and equipped in the past when there were many more locomotives to be maintained than is the case today.

For one reason or another, therefore, the actual physical size of most of our equipment-repair plants has not followed the trend of the job that they are called upon to perform, with the result that many roads have consider-

able apparent excess shop capacity. There is hardly a department in most locomotive shops of any size in which the machine-tool equipment could not be replaced with substantially fewer units than are now being operated with considerable saving in the cost of producing locomotive parts.

The Diesel-electric locomotive has brought into this picture a factor that is resulting in some uncertainty as to future policy. This newer type of motive power has demonstrated to the railroads the value of a parts replacement system in repair work and because of the facility with which the manufacturers of this type of power have made it possible to secure repair parts the question has arisen in the minds of many mechanical men as to whether or not the parts for the great number of existing steam locomotive units should continue to be made in railroad shops or purchased on the outside. This is not a question that can be settled without considerable study. Repair parts for modern steam locomotives in high-speed service have presented considerably different problems from parts for the older steam locomotives. Before any consideration can be given the question whether to manufacture or buy there are certain other questions that must be answered.

Up to this time there has been little question as to the possibility of manufacturing parts for Diesel-electric locomotives in railroad shops. There have been three important reasons for this: (1) the fact that the manufacturers of these locomotives have done an excellent job in supplying spare parts; (2) the fact that this is a new type of power to the railroads and performance, in the last four or five years, has been of utmost importance so that repair parts supplied by the builders have enabled the railroads to keep these locomotives running with a high availability; (3) the fact that up to now the number of Diesel-electric locomotive units in service on any one railroad has been relatively small.

There is a real question as to whether or not any railroad should consider the production, in its own shop, of Diesel-electric locomotive parts but that this is a possibility about which railroad officers are thinking is evidenced by a comment by J. P. Morris, general assistant of the Atchison, Topeka & Santa Fe, in a paper presented recently before the American Society of Mechanical Engineers in which he said in part, "The cost of material for [Diesel locomotive] repairs amounted to 47.74 per cent of the total cost of repairs and I am of the opinion . . . that material costs are too high if we are to maintain this type of power at a reasonable maintenance cost.

"Consideration will undoubtedly be given by the railroads that have fine machine tools to engage in the manufacture and repair of equipment that can be handled in their present facilities, unless a substantial decrease can be effected by the builders.

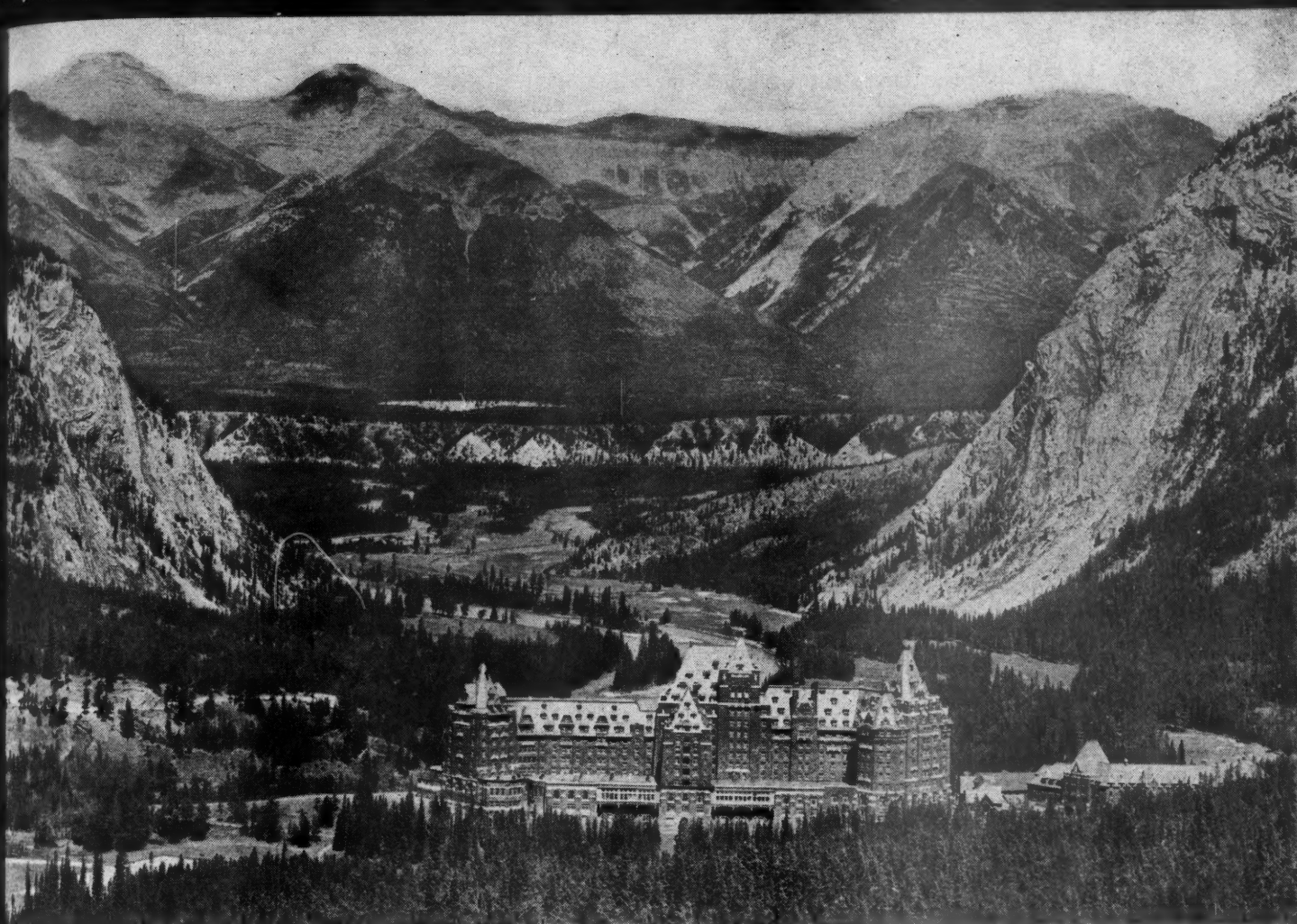
"When designing new locomotives the builders should give consideration to the standardization of parts insofar as possible, so that the railroads will not be required to make heavy investments in material stocks because parts are not interchangeable."

Is There Excess Capacity?

Most people look upon the railroad shop as a plant facility engaged solely in the repair of locomotives without realizing that in many shops as much as 25 or 30 per cent of the man-hours of the shop may be assigned to the production or repair of other-than-locomotive parts for the great variety of things which the railroad must have to maintain its service. It is logical that as long as certain facilities must be continued in use for one purpose or another their entire productive capacity should be utilized. This is one of the best reasons why the railroad shop can justify the making of locomotive parts rather than their purchase outside.

On the other hand, if a railroad company's own shop can not produce these parts of material of the required quality and can not meet the required standard of workmanship, then the performance of power in service is quite likely to suffer. Very often it is argued that a railroad can produce certain parts in its own shop cheaper than they can be purchased from outside suppliers without realizing that the difference in price is often paid for in the cost of delays to train operation.

As a general principle, if a thorough study of a railroad's requirements indicates that there is sufficient volume of a certain class of work to justify doing that work in the road's own shop and the part is one that can be satisfactorily produced to meet the same rigid specifications as an outside supplier is expected to meet, it may be expected that some roads will equip their shops with the proper facilities for doing the job. No railroad can afford to overlook its obligation to maintain adequate service to the public at all times and if, when a source of supply is being considered for parts that are normally manufactured in the company's shops, the railroad management can not absolutely assure itself of an adequate and continuing supply of such parts under all conditions, then it should, by all means, protect the service by maintaining the facilities with which to supply those parts.



"Tourism" was revived in Canada in 1946—This C. P. R. photo shows the Banff Springs hotel in Alberta

Traffic Large, Earnings Down in Canada

Dominion railways seek 30 per cent freight rate rise but socialistic politics threatens some difficulties

By RAILWAY AGE'S CORRESPONDENT IN OTTAWA

THE Canadian railways since the end of the war have played a part as essential to industrial reconversion as was their contribution to victory in the war. Their total carloadings for 1946 will be only slightly less than the high figure for the war which was 3,661,000 cars. Gross revenues have been large in 1946, but in the second half of the year the devastating effect of generous wage concessions approved by the National War Labor Board is shown in the earnings figures.

In the first ten months of 1946 the Canadian Pacific had gross revenues in excess of \$241,000,000 but net operating

income was only about \$14,000,000, while the Canadian National has gross of \$328,000,000 with net operating income less than \$35,000,000. The Canadian Pacific's decline in net was about 50 per cent, and that of the Canadian National was only slightly less.

Most of the decline in the net of both roads was attributable to the wage boosts which came in September and October and applied to most of the employees. This fresh handicap to profitable operation came on top of other difficulties imposed by war conditions, such as deferred maintenance, belated manufacture of new equipment and the necessity of getting a

large increase in the number of skilled employees. The railways had hoped that when hostilities ended and repatriation of troops was complete they would be able to restore the efficiency of their equipment and their manpower, but substantial wage increases have come before the hoped-for improvement in operating conditions.

To offset the increased wage and other costs the Canadian Railway Association has pending before the Dominion Transport Commission an application for authority to increase all freight rates, except those on coke and coal, by about 30 per cent. Public hearings on the appli-

cation will begin in January at Ottawa, and Chairman James A. Cross, of the Transport Commission, has revealed that hearings will also be held in various parts of the country. A final decision by the Board is not expected before the late summer or early fall.

All four Western provincial governments (Manitoba, Saskatchewan, Alberta and British Columbia) will appear before the Board to oppose the application while business organizations in central Canada (Ontario and Quebec) and other interests in the Maritime provinces will also put up a fight against the increase. From present indications it is doubtful if there will be any organized support of the move by any interests except the railways, despite the fact that during the war years honeyed words were frequently spoken in the Canadian Parliament about the splendid war service rendered by the railways, with the suggestion that there should be some tangible expression from the nation as an acknowledgment of the railways' contribution.

Need for Revenue

The Canadian people appear to believe that the railways can continue to perform an efficient transportation service in the face of steadily rising operating costs and with no corresponding increase in their freight charges. There has been no worthwhile freight rate increase since 1920, when the Canadian railways got something as a result of the so-called "McAdoo awards," which increased wages in the States and impelled similar increases north of the border. Those rate increases were subsequently largely removed, so the railways have had little if any freight relief for twenty-five years, while throughout the period wage rates have constantly risen and both wages and material costs have gone up greatly during the past year.

The public seems to accept extraordinary service from the railways as a gift of nature—appearing to lack a lively sense of the dependence of satisfactory service on earnings sufficient to provide an incentive for the continuing investment of additional capital.

Because the railways are a nationwide business and because a country as large as Canada is peculiarly dependent upon low-cost railroad transportation, it has been impossible to keep discussion of their charges out of the political realm, and in the coming year it is certain that both in the federal Parliament and the provincial legislatures railway freight rates will be the subject of lively and protracted debate.

Political Trouble Threatens

The discussion may well prove to be a repetition of the hot parliamentary battles in the inter-war period over the famous Crow's Nest Pass agreement. Under that agreement, completed fifty years ago, the Dominion Parliament granted aid to the Canadian Pacific to help build the line through the southern pass of the Rockies from Lethbridge, Alta., to Nelson, B. C. In return for this help the C. P. R. made specific cuts in freight rates, but principally a cut of three cents per 100 lb. on grain and flour from all points on its line to Fort William and Port Arthur (the head of the Great Lakes), and there were also specific cuts on certain commodities from Eastern to Western Canada. After these rate reductions were made the general level of freight rates in Canada was for a number of years below the Crow's Nest rates.

In 1918, however, as a result of the McAdoo wage award in the United States and its application also in Canada, the Canadian government granted compensation to the Canadian railways by way of a freight rate increase which for the first time established freight rates higher than those provided by the Crow's Nest agreement. In the following year Parliament legislated to have this Agreement disregarded for a period of three years. In 1922, by legislation, the eastbound Crow's Nest rates on grain and flour were again made effective, leaving only the Crow's Nest rates on westbound commodities under suspension. The westbound commodity rates were restored in the summer of 1924. The railways appealed the Board order to the Supreme Court of Canada, which decided in the following year that Crow's Nest rates applied exclusively to the designated traffic between points which were on the C. P. R. lines in 1897.

It recommended that Parliament make an appropriate amendment to the existing law. In 1925 such an amendment provided that eastbound rates on grain and flour would be those covered by the Crow's Nest Pass agreement. Subsequently a further amendment extended these statutory limits on rates to all traffic moving from all points on all lines west of Fort William to Fort William and Port Arthur, and wiped out the Pass rates on westbound commodities from Eastern to Western Canada.

Effect of Crow's Nest Rates

The principal point in considering the effect of the Crow's Nest rates on the railway revenues is that it has seriously reduced their revenues on the movement of grain in western Canada, both eastbound to the head of the Lakes and westbound to the Pacific. It has been suggested in some quarters that were it not for the Crow's Nest Pass pact it is pos-



These C. N. R. photos show interiors of new parlor car (left) and lounge car (right), built in company shops

sible
to cu
rates
It
if gra
of Ca
Presi
Pacifi
cent
Tran
derta
tions
tain g
are su

No
Dur
have
betwe
gover
and ag
since
tion th
gether
seek s
they c
reason
compe
riers.
the ra
before
was be
short c
ulation
little l
for rec
meet
Lakes
The r
impro
tic pr
downw
In t
public
domina
needs



C. P. R. "Beaver" ship leaving Montreal with relief supplies for Europe

sible the railways might have been able to cut their demand for increases in other rates from 30 to 20 per cent.

It is likely that a general rate increase, if granted, may force a complete revision of Canada's entire freight rate structure. President D. C. Coleman of the Canadian Pacific has hinted that once the 30 per cent increase has been granted, the Transport Commission might well undertake a careful survey of traffic conditions and determine whether or not certain geographical areas in the Dominion are suffering from rate discrimination.

Not Worried About Railways

During the past few months there have been many conferences at Ottawa between the Dominion and the provincial governments on financial, taxation, labor and agricultural problems, but at no time since the war has there been any suggestion that the governments should get together as they did before the war and seek some satisfactory basis on which they could legislate to give the railways reasonable protection from the unfair competitive practices of highway carriers. Just how completely hamstringing the railways was illustrated shortly before the outbreak of war. Legislation was being considered at Ottawa to go a short distance toward equalizing the regulation of rail and highway carriers. A little later the railways sought approval for reduced rates on package freight to meet water competition on the Great Lakes but they were forbidden to do so. The railways seem to have trouble in improving their position by more realistic pricing, whether it is upward or downward that they want to go.

In the face of such handicaps and a public opinion which appears to be, predominantly, either indifferent to their needs or opposed to giving them relief,

the railways will this year embark on an impressive rehabilitation and expansion program. The Canadian National has already announced that it will begin the construction of a large hotel in Montreal. Both roads will make considerable expenditure for bridges, new steel, and new equipment. How far they can go in the direction of keeping their properties abreast of the demand for transportation service will depend to a considerable degree on the success of their rate application before the Transport Board.

It must be remembered that outspoken socialism is a strong political force in Western Canada where there is organized opposition by the provincial governments against freight rate increases. The socialist government in Saskatchewan and the "Social Credit" government in Alberta probably believe that it is better for all the people to have low freight rates than to have prosperous railways. If the railways go broke, then so much the better, because that will force the extension of government ownership.

C. P. R. Expands, Needs More Revenue

By D. C. COLEMAN*

Among the most important contributions of the Canadian Pacific to Canada's prosperity during the past year has been the return of our "Beaver" ships to fast freight service between Canada and the United Kingdom and Europe. Last March the first of the new-built vessels, the 10,000-ton turbo-electric Beaverdell, made her maiden voyage to Saint John, N. B. As the season developed she was joined by two sister ships, Beaverlgen and Beaverlake, and two Empire vessels purchased from the Admiralty

* Chairman and President, Canadian Pacific.

and renamed "Beaverford" and "Beaverburn."

By the time navigation had closed in Montreal our "Beavers" had carried 200,000 tons out of that port to the United Kingdom and Europe and had brought to this country 60,000 tons of cargo from the other side. By April, 1947, we hope a beginning will be made on the resumption of the seaborne passenger trade in which we led on the North Atlantic, with the "Empress of Canada" coming back from refitting after troop service.

Another outstanding event in our record for 1946 was the reopening of the 11 summer hotels and lodges which we operate from the heart of the Canadian Rockies to the Bay of Fundy. Wartime travel restrictions were lifted last year for the first time and more than 20,000,000 visitors came to this country from the United States. The Canadian Pacific shared not only as a transportation agent but as a host in handling this influx which demonstrated so conveniently the ever-improving position of tourism in the Canadian economy.

With the war loads removed, schedules could be revised to meet the special needs of the times. Fast freight service between chief centers of population was restored and improved to guarantee delivery in Montreal today of goods picked up from shippers in Toronto before 5 p. m. yesterday and vice versa.

From March on, when the peak of troop repatriation was passed, the passenger and sleeping-dining car departments were able to concentrate on civilian trade in the manner which has brought the Canadian Pacific the name of "a passenger road," the trade's highest tribute. Restricted during wartime to what was required to keep up the property, the operating department dug into the backlog of maintenance to the extent of initiating a \$36,110,454 program which was highlighted by \$1,951,631 for automatic block signals—386 additional miles of track being so protected in 1946, bringing to 2,631 the mileage thus equipped.

Integrated with the fast freights and the meeting of export schedules were short cuts in yard practice and improvements in technique. Such a betterment was in the installation of frequency modulation radio communication between yard offices and four of the 15 Diesel-electric switch engines the Canadian Pacific uses in Toronto terminals.

More than \$16 million was allotted for new rolling stock, including 14 new Diesels. Because of the need to fill export orders of countries whose railroads were near-casualties of war, our line, in common with other Canadian roads, was placed on a quota for new steam locomotives. Part of the difference between what we could actually order and what we should have liked to

have been made up by our own mechanical department, through conversion of older locomotives so successfully that they bettered the performance of the modern engine taken as a model for the changeover.

Passenger equipment, too, has not come to us with the speed we desired because of shortages in material and work stoppages, but here too conversion has filled the gap. More and more cars have been put into service from our Angus Shops as complete "rebuilt" with most of them containing, for test, some features of the new cars which we still hopefully await.

The wage increase granted by the National War Labor Board has increased the operating payroll of the railway by \$15,300,000 per annum, and by \$8,700,000 for the period from June 1 to December 31 of this year. In ancillary operations the increase amounts to \$2,400,000 yearly, and payroll costs have advanced \$1,300,000 for the retroactive period of 1946. The total increase in 1947 in payroll costs will amount to almost \$18,000,000.

The progressive increase in wages, the large increases in the costs of materials and supplies which hold at the present time and which can be expected to go further in the future, coupled with a sharp decline in revenue, have led Canadian railways to join in an application for a 30 per cent increase in freight rates which the Canadian Railway Association has presented to the Board of Transport Commissioners.

The role which the Canadian Pacific must play in the prosperous era which lies immediately before us will be determined to a large extent by this decision. The new stature which Canada has assumed among nations of the world as a leading international trading power will be served best by a strong internal transportation system.

Price Increases Reduce C.N.R. Net

By R. C. VAUGHAN*

In common with all other railways, the Canadian National System suffered a serious decline in net revenues in 1946. Operating costs were affected by higher wage rates and higher unit prices for materials, these costs representing an increase at the rate of \$30,890,000 per annum over 1945. An indication of what has happened to costs of railway operation and maintenance can be shown by a comparison with pre-war levels. The cost of untreated railway ties, for example, increased by 93.3 per cent in 1946 over 1939; treated ties by 45.1 per cent; new rail by 23.1 per cent a

* Chairman and President, Canadian National.

ton; coal by 51.3 per cent; steel products by 19.2 per cent and lumber and forest products by 57.4 per cent. The average wage earned in 1946 showed an increase of 43 per cent over 1939. These increases in material costs and payroll expense have added over \$90,000,000 to our operating charges for the year 1946 as compared with 1939.

Revenue tons of freight moved in 1946 are estimated at 79,975,000, as compared with 79,941,000 in the previous year. Notwithstanding this slight increase in tonnage, the gross freight revenues declined \$16,500,000, due to a substantial drop in the average haul and in the class of commodities transported. Approximately 22,081,000 revenue passengers were carried during the year, a decrease of 27 per cent from the 1945 total of 30,370,680. Operating revenues of the system have been estimated at \$399,100,000, a decrease of \$34,673,000, or 8 per cent, from 1945.

These results emphasize the urgent necessity for an upward revision in rates on all freight traffic carried in Canada. On behalf of its member companies, the Railway Association of Canada has made formal application to the Board of Transport Commissioners for authority to make a general advance in freight rates, the present level having been established by the Board in 1922.

During the past year, the demand for freight cars has been extremely heavy, particularly for box and refrigerator cars. At the same time, without the pressure of wartime necessity, combined with certain changes in the nature of commodities now transported by rail, the average tonnage per car has decreased. Loading and unloading has slowed. A contributing factor having some considerable effect is the gradual increase in the adoption of the five-day work week by industry, which, in effect, places upon the railways the burden of increased freight car ownership to handle an equal quantity of traffic. Heavy demands were made upon us to move large quantities of grain by rail, usually moved by water,

as well as cement, lumber and other forest products, building materials and miscellaneous consumer goods.

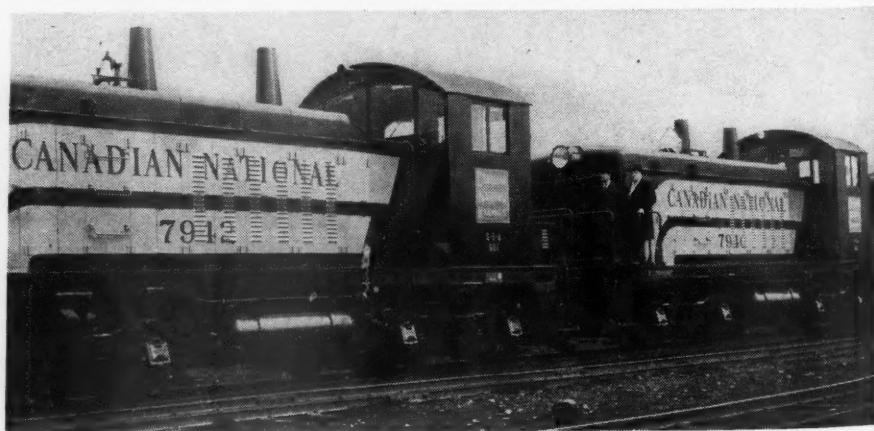
New equipment received during the year consisted of 856 box cars and 16 Diesel-electric switchers. Approval has recently been given for the purchase of 3,000 units of various types of freight car equipment. The company has in hand a program for modernizing its passenger equipment. This includes the purchase of 70 cars and the reconstruction, in the company's shops, of 37 additional units.

The new Diesel-electric car ferry which is under construction for use between Cape Tormentine, N. B., and Borden, P. E. I., will be the most modern ice-breaking car ferry in the world. It is equipped with four propellers, two at the bow and two at the stern, and it will rank high for maneuverability as well as power. No steamship to be built in Canada will be more modern than the vessel under construction for our Pacific Coast service.

Approval has recently been given to proceed with the construction of an office building and a hotel in the new Central Terminal area of Montreal. These new units are being planned to accord with the general design for the development of the whole area.

The new line from Eastern Junction to Bout de l'Ile on the Island of Montreal is proving its value. During 1947 construction will proceed on a new branch line to provide initial rail access to extensive stands of lumber and pulpwood in the Abitibi section of Quebec and to open the country to colonization.

This coming year will see the return to the Canadian National (West Indies) Steamships, Ltd., fleet of the "Lady Nelson" and the "Lady Rodney," now released from war service. The first of three new motor vessels, the "Canadian Cruiser," went into operation in 1946. When the two remaining Lady ships and the three new motor vessels are in commission, a fleet of twelve ships will be in service.



The C. N. R. has just received 16 additional Diesel-electrics, giving it a total of 50 locomotives of this type



Rehabilitation of locomotive power, including purchase of 37 Diesel-electric locomotives, 32 new and 52 used steam locomotives, was the most outstanding development on the National Railways in 1946

Mexican Railways Had Unsettled Year

Gross revenues continue to climb, but higher operating expenses cut deeply into net earnings; rehabilitation of equipment and roadway continued; labor conditions better

By OUR CORRESPONDENT IN MEXICO

THE outstanding development on the National Railways of Mexico during 1946 was the rehabilitation of tractive power and rolling stock, with the purchase of 37 new Diesel-electric locomotives, 32 new and 52 used steam locomotives, 1,500 new all-steel box cars, 119 new all-steel passenger and express cars, 58 used passenger cars, 300 used tank cars, and 50 new narrow-gauge tank cars. At the same time rehabilitation of the tracks continued at an accelerated rate, especially on the line from Mexico City to Laredo, for which 61,850 tons of new 112-lb. rail were purchased, 36,000 tons of which were obtained from American mills.

The investment required for this rehabilitation amounted to 161,848,327 pesos, and although not all of the equipment has been received, the major part of it has been paid for; only the sum of 9,807,597 pesos is still outstanding. To be able to meet these obligations it was necessary for the Mexican government to allow the National Lines the use of approximately 75,000,000 pesos, which was taken from the 10 per cent tax on gross railway earnings. It was also

Further adjustment from war to peace during 1946 saw the National Railways of Mexico go through many of the problems which confronted roads in the United States during the year, including a decline in traffic and large increases in costs. As a result, in spite of being blessed with improved labor conditions and a general 20 per cent increase in freight rates throughout the year, net earnings decreased sharply, showing a drop of 82.7 per cent in the first eight months, compared with the similar period of 1945. However, with government assistance, the National Lines continued rehabilitation of motive power, rolling stock and tracks on a sizable scale, and made marked progress in an ambitious educational program for employees.

necessary for the National Lines of Mexico to arrange for a loan of 72,882,065 pesos through the Mexican government.

Besides this comparatively heavy investment, which speaks for itself as to

the intentions of the Mexican government to continue the definite rehabilitation of the National Lines, the railroads bought materials from American firms amounting to 120,765,188 pesos, of which sum 248,805 pesos are still available for the payment of undelivered materials.

National Lines Expanded

The Mexican government purchased the Mexican Railway and took possession of it on June 1, 1946. This was a British-owned standard-gage line which extends from Mexico City to Vera Cruz and Pachuca, a total of 518 miles, of which 401 are operated. The purchase price was 48,000,000 pesos, and although the road has not as yet been incorporated in the National Lines system, Manuel M. Palacios, the present general manager of the National Lines, is in charge of it as manager. It takes in the Vera Cruz terminal, the operating expenses of which are absorbed by the National Lines and the Mexican Railway on a 60-40 per cent basis, respectively.

Due to the run-down condition of the Mexican Railway, the Mexican govern-

ment provided a loan of 20,075,413 pesos, which was used for the purchase of 10 new and 10 used steam locomotives, 6 Diesel-electric locomotives, 61 new all-steel passenger and express cars, 50 tank cars, and 90 used stock cars; also 1,650 tons of rail and accessories. The purchase and rehabilitation of this line will provide direct international service from the Rio Grande to the Suchiate river, on the Guatemalan border, without any bottlenecks whatsoever.

The United States Railway Mission, created by agreement between the American and the Mexican governments on November 18, 1942, to help the National Lines in rehabilitation and to aid in

handling the heavily increased war traffic from Central America, and that originating in Mexico, to the United States, closed its operations on June 30, 1946.

Line Rehabilitation

Rehabilitation of the roadbed and tracks continued during the year, especially relaying 112-lb. rail on the Mexico-Laredo line, and from Mexico to Irapuato, on the line to El Paso and Guadalajara.

Another 2,000-hp. Baldwin Diesel-electric locomotive was added to the run from Ciudad Juarez to Torreon, making a total of three Diesels handling passenger trains Nos. 7 and 8 operating

between these points. Diesel locomotives are also handling freight trains from Monterrey to San Luis and to Mexico City.

Modern first-class and second-class coaches, purchased recently, are now being used to handle local passenger traffic between Mexico City and Laredo, and from Mexico City to Guadalajara. An all-Pullman train is also operated between the latter points.

International Trains 1 and 2, Mexico City to Laredo and return, now handle through Pullman cars to New York, via the Missouri Pacific system and the Pennsylvania and the New York Central, which is an added attraction to tourist travel.

Vast Educational Program

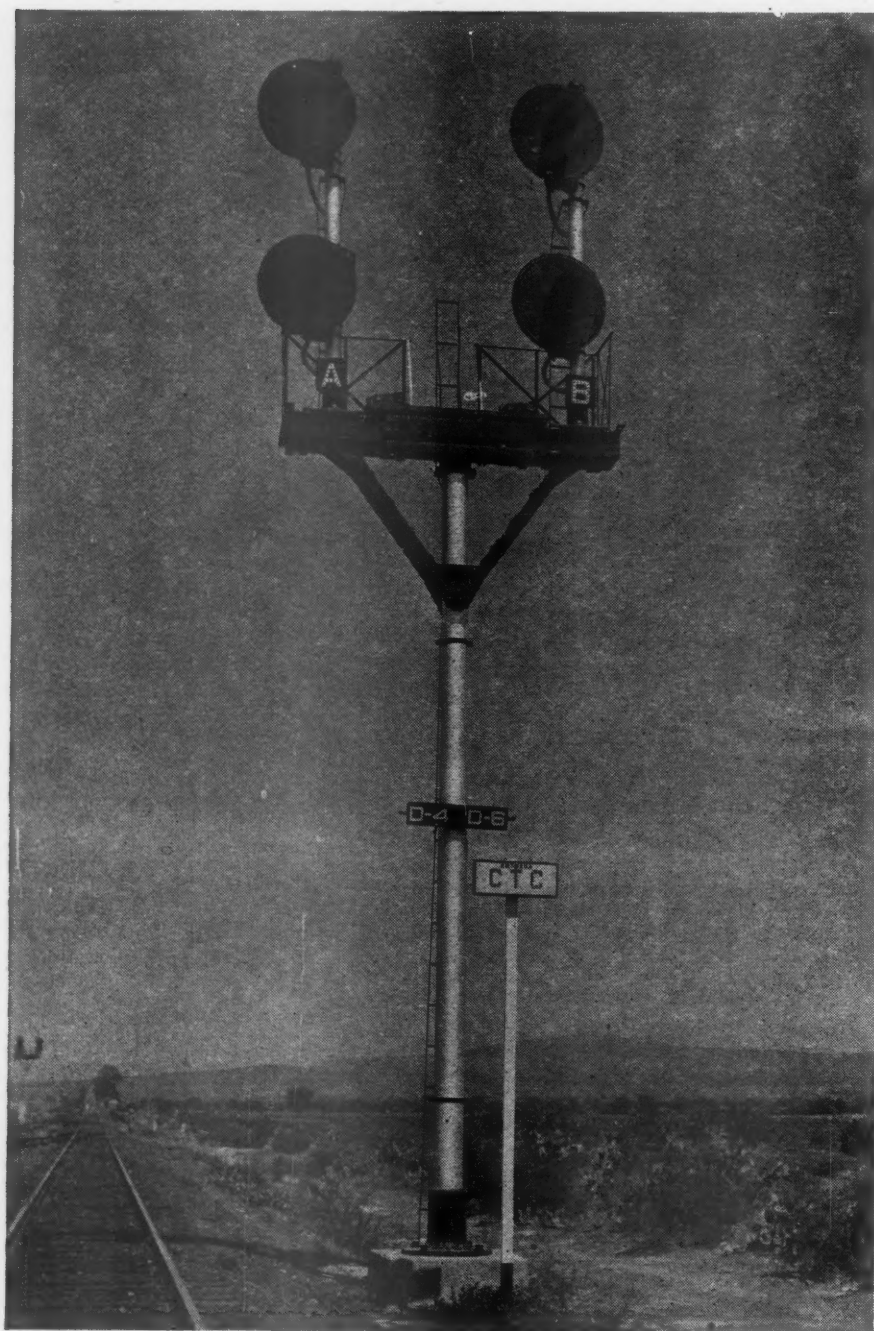
The National Lines have embarked on an ambitious educational program with the view of technically training their personnel, giving oral, written and manual classes, and using visual aids as well as correspondence courses. This program was begun with 1,800 pupils, which increased to 5,000 in a six-month period. The courses offered to date cover supervision, advanced mechanics, Diesel-electric locomotives, steam locomotives, air brakes, electricity, mathematics, maintenance of way, and transportation salesmanship. The Railway Educational Bureau, of Omaha, Neb., has permitted the Mexican government to translate into Spanish and use all of its text books and other material used by a number of United States lines for training purposes.

Three schools are now in operation; one at Mexico City, a second at Aguascalientes, and a third, inaugurated only during the latter part of December, at Monterrey. These schools are equipped with air brakes, machinery and apparatus for manual training, and were built at a cost of approximately half a million pesos each. Other schools will be built at Guadalajara, Matias Romero, Puebla, San Luis Potosi, and other major railroad centers.

Traffic off During Year

There was no friction worthy of mention during 1946 between management and labor on the Mexican railways, but difficulties arising between the Syndicate and the Fraternity (train and engine crews) seriously handicapped the operation of trains. However, the government cancelled registration rights of the Fraternity and ordered its members re-incorporated in the Syndicate, which settled the affair.

While there was a slight increase in the number of cars of freight imported, the exported cars showed a large decrease, most of which was due to a



The National Railways have centralized traffic control on the 22.5 miles of single-track main line between LaGriego and Mariscal. The above photograph shows C. T. C.-controlled signals in this territory at LaGriego

considerable slackening in exports of concentrates, as reflected elsewhere in this article. Increases in imports through El Paso and Brownsville were offset by

| | Loaded Cars Interchanged—10 Months | | | |
|-------------------|------------------------------------|--------|---------|--------|
| | Imports | | Exports | |
| | 1946 | 1945 | 1946 | 1945 |
| Laredo | 15,282 | 15,978 | 8,813 | 12,168 |
| El Paso | 2,977 | 2,765 | 5,267 | 6,564 |
| Eagle Pass | 3,581 | 3,982 | 1,975 | 2,170 |
| Brownsville | 2,807 | 1,718 | 2,256 | 2,990 |
| Totals | 24,647 | 24,443 | 18,311 | 23,892 |

decreases at Laredo and Eagle Pass. Exports decreased at all gateways.

The following table shows the trend of traffic by commodities during the year, which resulted in a reduction of 107,875 tons loaded in the first seven months of 1946, compared with the same period of 1945.

| Commodity | First seven months | |
|-----------------------------------|--------------------|-----------|
| | 1946 tons | 1945 tons |
| Forest products | 398,847 | 396,686 |
| Agricultural products | 1,943,278 | 2,096,817 |
| Animals and animal products | 195,295 | 174,378 |
| Inorganic products | 3,571,369 | 3,644,964 |
| General merchandise | 917,431 | 821,250 |
| Totals | 7,026,220 | 7,134,095 |

Notwithstanding the fact that there was a decrease of 50,445,000 net ton-kilometers handled on all trains, gross earnings continued upward and an increase of 21,742,086 pesos was recorded. This increase was due largely to the fact that a larger proportion of higher classification freight was handled on which higher rates are applicable. It reflects particularly a reduction of 141,019,085 ton-kilometers, or 26.42 per cent, of concentrates and mineral traffic, which made equipment available for shipments paying a higher rate. On the other hand, the increase of up to 20 per cent in freight rates approved January, 1945, was adjusted on January 1, 1946, so that an average 20 per cent increase was established.

Gross railway earnings during the first eight months of 1946 amounted to 267,001,765 pesos, compared with 245,259,679 pesos in the same period of 1945, an increase of 8.86 per cent. Freight revenues increased from 151,423,918 pesos to 168,282,657 pesos, or 11.13 per cent; passenger earnings from 54,931,882 pesos to 57,722,787 pesos, or 5.08 per cent; baggage receipts from 125,586 pesos to 260,717 pesos, or 107.60 per cent; express income from 22,776,156 pesos to 23,122,611 pesos, or 1.52 per cent; telegraph earnings from 23,245 pesos to 26,830 pesos, or 15.42 per cent; and miscellaneous earnings from 8,888,246 pesos to 10,652,883 pesos, or 19.85 per cent. Total operating earnings increased from 238,169,033 pesos to 260,068,483 pesos, or 9.19 per cent, while other than operating revenues decreased from 7,090,645 pesos to 6,933,282 pesos, or 2.22 per cent.

Total expenses increased from 221,-

865,666 pesos to 262,960,483 pesos in the first eight months of 1946, compared with the similar period of 1945, or 18.52 per cent, especially because of tremendous increases in the prices of materials and higher operating expenses. Maintenance of way expenses in these two periods increased from 43,444,503 pesos to 50,703,307 pesos, or 16.71 per cent; mechanical department expenses increased from 69,058,028 pesos to 73,777,182 pesos, or 6.83 per cent; traffic department expenses increased from 1,772,873 pesos to 1,999,593 pesos, equivalent to 12.79 per cent; transportation department expenses increased from 70,430,055 pesos to 92,882,438 pesos, or 31.88 per cent; express department expenses increased from 9,525,146 pesos to 12,786,284 pesos, or 34.24 per cent; miscellaneous expenses decreased from 985,570 pesos to 713,019 pesos, or 27.65 per cent, and general expenses increased from 12,478,952 pesos to 14,647,185 pesos, or 17.38 per cent. Total operating expenses increased from 207,695,128 pesos to 247,509,008 pesos, that is, 19.17 per cent. Other than operating expenses increased from 14,170,538 pesos to 15,451,475 pesos, or 9.04 per cent. Total railroad expenses increased from 221,865,666 pesos to 262,960,483 pesos, or 18.52 per cent. The increase in expenses is attributed in particular to the considerably higher prices paid for materials, intensified maintenance of the tracks and equipment, and to increases in salaries in the transportation and express departments.

As a consequence of the proportionately higher increase in expenses than in earnings, net railroad earnings decreased from 23,394,013 pesos to 4,041,282 pesos, or 82.73 per cent.

Operating Statistics

There was a comparatively slight decrease of 50,445,000 in net ton-kilometers (0.9 per cent), and of 11,859,000, or 0.1 per cent, in gross ton-kilometers in the traffic handled by the National Lines during the first eight months of 1946,

compared with the same period of 1945. Total locomotive-kilometers increased from 27,383,569 to 27,644,422, or 1.0 per cent, a balanced proportion having been kept in the train-kilometers, which increased from 21,102,869 to 21,321,310, or 1.0 per cent. However, there was a decrease of 2,398,735 (1.4 per cent) in the loaded-car kilometers, and an increase in the empty-car kilometers of 6,803,810 (9.2 per cent).

The table of selected operating statistics shows that lighter trains were handled during the first eight months of 1946 compared with the same period of the previous year, both as regards net and gross tons. Freight train speed was reduced from 18.1 to 18.0 kilometers per hour. These two factors produced a decrease from 16,198 to 15,768 in the gross ton-kilometers per train-hour. The percentage of loaded-car kilometers to total decreased from 70.5 to 68.3, and the car-kilometers per car daily was also reduced from 49.7 to 43.8. The total number of cars loaded was reduced from 338,869 to 323,279, notwithstanding the fact that the cars available on line daily increased from 22,113 to 23,977. The only operating factor that indicates a slight improvement is the net tons loaded per car, which rose from 30.5 to 30.6.

Labor repair costs per 1,000 kilometers run for passenger cars increased from 47.72 to 59.14 pesos, or 23.9 per cent. Materials increased from 26.14 to 27.33 pesos, or 4.6 per cent. Freight car repair costs for labor per 1,000 kilometers run increased from 44.01 to 54.33 pesos, or 23.4 per cent, and for materials from 38.51 to 44.72 pesos, or 16.1 per cent.

Labor for backshop repairs increased from 449.47 to 532.79 pesos per 1,000 kilometer run, or 18.5 per cent, and materials from 199.40 to 242.31 pesos, or 21.5 per cent. Labor for running repairs increased from 300.61 to 359.28 pesos per 1,000 kilometers run, or 19.5 per cent, while material cost decreased from 156.74 pesos to 79.24 pesos, or 49.4 per cent, principally because of lack of materials.

SELECTED OPERATING STATISTICS (FIRST 8 MONTHS 1946—1945)

| | 1946 | 1945 | Increase or Decrease | Per cent Change |
|---|-------------|---------------|----------------------|-----------------|
| Locomotive klms. | 27,644,422 | 27,383,569 I | 260,853 | 1.0 |
| Freight train klms. | 11,660,174 | 11,367,724 I | 292,450 | 2.6 |
| Passenger train klms. | 6,411,908 | 6,484,645 D | 72,737 | 1.1 |
| Mixed and spec. klms. | 2,958,200 | 3,027,281 D | 69,081 | 2.3 |
| Non-revenue train klms. | 291,028 | 223,219 I | 67,809 | 30.4 |
| Total train klms. | 21,321,310 | 21,102,869 I | 218,441 | 1.0 |
| Passenger car klms. | 61,295,500 | 63,498,736 D | 2,203,236 | 3.5 |
| Frt. loaded car klms. | 174,414,703 | 176,813,458 D | 2,398,735 | 1.4 |
| Frt. empty car klms. | 80,955,458 | 74,151,648 I | 6,803,810 | 9.2 |
| Total frt. car klms. | 255,370,161 | 250,956,086 I | 4,405,075 | 1.8 |
| Net ton-klms. (1,000s) | 5,343,692 | 5,393,137 D | 50,445 | 0.9 |
| Gross ton-klms. (1,000s) | 11,508,398 | 11,520,257 D | 11,859 | 0.1 |
| Total number cars loaded .. | 323,279 | 338,869 D | 15,590 | 4.6 |
| Net tons per train km. | 428 | 443 D | 15 | 3.4 |
| Gross tons per train km. | 874 | 895 D | 21 | 2.3 |
| Speed per hr. (klms.) frt. | 18.0 | 18.1 D | 0.1 | 0.6 |
| Gross ton-klms. per train hr. | 15,768 | 16,198 D | 430 | 2.7 |
| Frt. locomotive klms. daily .. | 170 | 181 D | 11 | 6.1 |
| Liters oil per 1,000 g.t.klm.—frt. | 51.7 | 47.2 I | 4.5 | 9.5 |
| Per cent loaded car klms. to total .. | 68.3 | 70.5 D | 2.2 | 3.1 |
| Car klms. per car daily | 43.8 | 49.7 D | 5.9 | 13.9 |
| Net tons per car | 30.6 | 30.5 I | 0.1 | 0.3 |
| Cars on line daily | 23,977 | 22,113 I | 1,864 | 8.4 |
| Klms. line operated | 11,728 | 11,734 D | 6 | 0.1 |



A big demand for railway fuel is expected to persist throughout the year and many roads are hopeful of receiving a better grade of coal

Railway Materials—How Much and When?

By **FRED W. SMITH**

Associate Editor
Purchases & Stores Department

RAILWAY procurement officers as a whole face the new year with a spirit of confidence and optimism, notwithstanding the probability that procurement problems will be hectic in the months that lie ahead, and that rail transportation will face the toughest competition it has yet encountered. Substantial basis for such optimism is afforded by the increase in freight rates, effective January 1, 1947; the accumulation of liquid assets during the war years; and other factors considered in detail in the first article in this issue.

After four years of war, during which they were hampered by rigid controls, material shortages and extended deliveries, many procurement officers had anticipated a more satisfactory supply of most railway materials during 1946. Labor strife, however, beginning with the steel, railroad and coal strikes during the first half of last year, retarded industrial production to such an extent that railway procurement problems, instead of improving, actually became more acute.

After crippling delays due to work stoppages, material shortages and re-

conversion complications, industry began again to go into high gear during 1946, with production of numerous commodities reaching new heights. The elimination of Office of Price Administration controls from most items created an air of temporary uncertainty, but the

In view of the freight rate increase and other factors, commented upon in pages 1-6, it is anticipated that heavy buying will continue throughout 1947. While the material situation showed improvement in some categories during 1946, shortages of many items still complicated railway buying and all signs point to the continued use of many expedients during the first part of 1947. The elimination of price controls has caused considerable confusion, but procurement officers agree this situation is only temporary and should soon clear. Although 1946 saw sharp increases in railway inventories, railway purchasing officers generally are cautious against overstocking.

situation, if kept free from outside interference, is bound to become stabilized with manufacturers once again being able to quote prices prior to date of delivery.

The pent-up demand for both durable and nondurable goods has not begun to be satisfied. A survey conducted recently among railway supply companies confirms this since their orders assure maximum production, ranging from 6 to 18 months. One large railway equipment manufacturer, for example, reported on October 1 that his company had a backlog of orders totaling \$229 million.

The large number of passenger cars, freight cars and locomotives now on order by the Class I railroads is a continuation of the extensive modernization program inaugurated in 1945, and is an indication of what can be expected in the next five years as rapidly moving railway programs get under way to modernize equipment, road and other facilities to meet competitive freight and passenger transportation with even more dependable and efficient railway service.

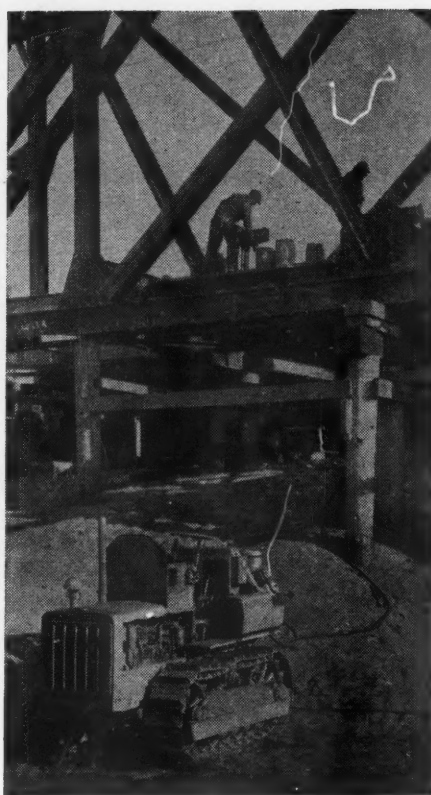
Considering all factors, there is little reason for the pessimistic attitude many have assumed. The major dark clouds on the horizon at this writing are labor strife and labor's low rate of production. Indications are that these situations are approaching a "show-down." With labor's cooperation, production bottlenecks can be eliminated or minimized.

Heavy Railway Buying

Railway purchases of equipment, materials, supplies and fuel in 1946 aggregated \$2,231,707,000 and topped similar expenditures during any other year since 1923. There were \$339,203,000 (or 18 per cent) more than 1945 purchases and \$292,947,000 (or 15 per cent) more than 1944's. The 1946 totals included \$1,048 million for materials and supplies received from manufacturers; approximately \$554 million for fuel deliveries; and \$629 million in equipment orders placed during the year. The last named consisted of approximately \$190 million for 43,325 new freight train cars, \$229 million for 1,986 new passenger train cars, \$202 million for 763 new Diesel-electric locomotives, and almost \$8 million for 48 new freight locomotives.

The monetary value of inventories of materials and supplies for Class I railroads increased steadily from \$595,759,000 on January 1, to \$628,110,000 on September 1, 1946, according to reports of the Interstate Commerce Commission. Although the total increase has been greatly influenced by higher prices for most items, nevertheless, inventories of numerous individual items have shown a substantial increase compared with pre-war stocks. Heavy freight and passenger traffic during 1946, with its heavy wear and tear on much of the old equipment the roads have been required to retain in service due to their inability to obtain replacements, has caused the roads to maintain supplies to meet most any eventuality.

One purchasing officer, while cautioning against overstocking, is of the opinion that a policy of selective buying should be followed as protection against the prospect of further price increases. At the same time another procurement officer warns against making purchases that are not essential for current operations. He qualified this observation with the statement: "Until some semblance of order begins to emerge from the present chaotic condition, it is, and will be, impossible to do any orderly planning. We are headed for a buyers' strike which will result in less buying during the first half of the year. This situation will naturally bring prices more in line, and all classes of materials should be available to meet railway requirements during the last half of 1947".



The mechanization of work gangs as a means of promoting greater efficiency is expected to continue at a fast pace

The chief procurement officer of an eastern road, commenting upon the general material situation, stated: "The policy of my company has been to keep in close touch with our regular sources of supply, in order that they may have

a better understanding of our requirements and that we may be fully aware of their problems. This policy was inaugurated prior to the war and indications are that it is paying dividends and is proving helpful to the industry. Our purchases are based on a declaration of requirements, as nearly accurate as possible, and as far ahead as necessary to meet the suppliers' conditions. Labor difficulties had an effect on acceptance of materials sooner than anticipated, extension of acceptance and, in some cases, cancellation of orders. At present we are finding by common consent a better understanding as to delivery periods, and not being required to place orders so far in advance indicates more supplies are becoming available, or anticipated as becoming available, if labor difficulties do not intervene."

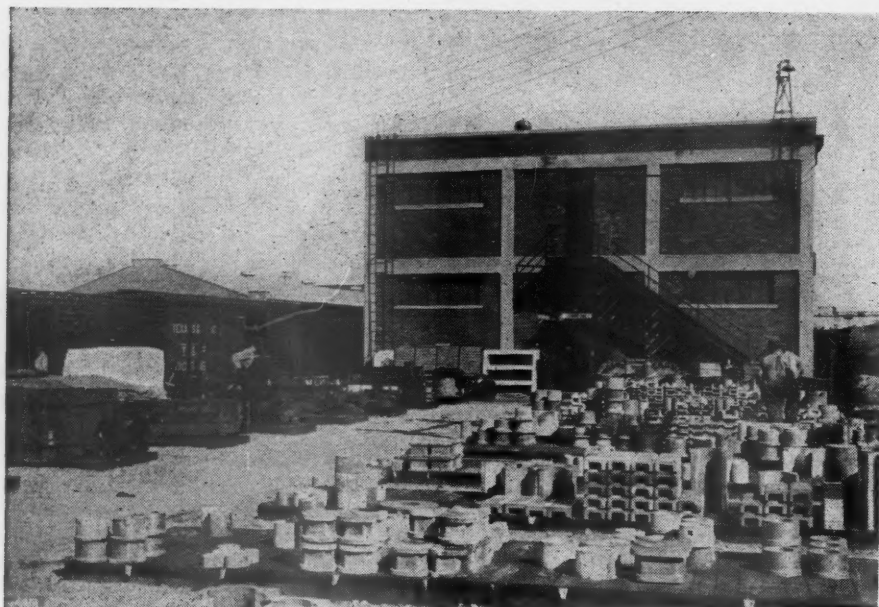
Steel Prospect Complicated

Steel deliveries at the year's end had become the railways' No. 1 procurement problem. Strikes within the industry beginning January 14, and lasting until February 17, seriously retarded steel production, and in addition the April coal strike and the rail and maritime strikes further complicated matters to such an extent that, although a high production rate was maintained throughout most of 1946, producers were unable to satisfy the increasing demands of industry.

In the light of the November coal strike, the threatened steel strike and the general industrial uncertainty prevailing throughout the country, the outlook for iron and steel products is com-



Large rail purchases are indicated by the extensive relaying programs planned by numerous roads—depending upon the availability of rails and fastenings



Modern storehouse constructed recently by the Texas & Pacific at Marshall, Tex.

plex, and the general prospect is complicated further by so many different factors that any statement as to what may happen with steel in 1947 would have to be qualified.

As with practically all other materials or products, the outlook for rail and special trackwork must be tempered by consideration of possible wage and labor disputes, which could have serious repercussions if they should result in prolonged "work stoppages." Rail purchases by Class I roads during 1946 are estimated at \$56,922,000, compared with \$77,038,000 for 1945 and \$75,763,000 during 1944; and because of the unprecedented demands of all industry for steel, indications are that the railways may not be able to obtain more than 50 to 75 per cent of the rail they would like for 1947, although it is expected that purchases will reach from \$75,000,000 to \$100,000,000, if production is not unduly retarded.

Railway purchases of spikes and tie plates were strictly limited last year because of the general steel shortage, and, in addition, the hesitancy of some manufacturers to resume production of these items due to price restrictions and labor difficulties further complicated the picture. However, the resumption of production of these items by some producers, as well as increased production facilities by other manufacturers, are expected to keep spike and tie-plate production more nearly in line with requirements during 1947 than they were last year.

At the close of the year the output of such products as cast steel truck side-frames, bolsters, coupler yokes and couplers for freight and passenger cars,

and castings for cars, locomotives and tenders had been severely restricted because of the coal strike and its effect on related industries. Manufacturers reported that five to six months were required for delivery of rolled steel wheels and steel tires for locomotives. The general steel shortage, plus an accelerated car building program, created a tight situation for steel wheels and axles, although replacement supplies were generally available. Draft gears for repairs were being delivered from producers' stocks, and on quotations for new equipment manufacturers were in a position to meet the car builders' schedule.

Brake Shoe Supply Tight

Many roads reported deliveries of brake shoes running just nip and tuck with consumption, and the borrowing of brake shoes from cars laid-up for other repairs was not an uncommon practice during 1946. August brake shoe production reached 90 per cent of the maximum rate, and expectations were that top production would be reached during the fourth quarter. If this goal was attained, minimum requirements were assured, but even maximum production rates would fail by about 5 per cent of meeting requirements under normal peacetime practices.

Wrought iron products were drastically short during 1946 and mounting demands have not tended to stabilize the market. The smaller sizes of pipe were especially critical and the continued shortage suggests the wisdom of anticipating needs well in advance. Improvement in production is expected in 1947,

but the unusual demand indicates that many specific products may continue out of balance.

Hardware was also short in supply, and all indications point to a continuance of this situation for at least the first half of 1947. Hardware was placed on the list of critical products by the Civilian Production Administration to assure the industry aid in securing production materials, and equipment, repair and maintenance supplies. This class of material was also placed on C. P. A. Schedule A of Direction 13 to M-21, providing for the channeling of merchant pig iron to the industry for the fourth quarter of 1946. This action, in addition to the raw materials assistance extended previously, resulted in a somewhat increased supply, but production was estimated to be 25 per cent below demands during 1946.

Because of strikes in the plants of some of the major smelting companies, lead was among the critical items throughout last year. However, production jumped to 60,400 tons during the second quarter, and government estimates indicated that it would reach approximately 90,000 tons during the third quarter and 95,000 tons during the last quarter. Since the price issue was somewhat clarified, there was additional hope that these goals would be attained.

In the face of a world-wide lead shortage the United States is importing more lead than before the war. During the second and third quarters lead imports averaged 19,400 tons, while fourth quarter imports were expected to aggregate 32,500 tons. Because of the continued lead shortage, restrictions more severe than ever before are expected, notably by reducing allotments for sheet, pipe, batteries and chemical plants.

Strenuous efforts were made to increase the production of copper during the last half of 1946 to help meet the growing demands from industry. Serious work stoppages during the first half reduced the supply of copper and affected the production of all copper products, including wire, magnet wire, coils, switches, tubing, etc. On the other hand, output of refined copper gained momentum during August and totaled 59,600 tons, compared with 19,000 tons produced in April.

Government copper stocks at the beginning of last year aggregated approximately 500,000 tons, but, despite imports which reached a peak of 27,800 tons during July, this reserve had dwindled to 197,000 tons at the end of August. In spite of this reserve stock and imports, voluntary rationing of copper and copper products became necessary to assure equitable distribution. With the gradual improvement



Heavy car building and construction programs are expected to keep railway lumber requirements at a high level throughout 1947

and the return of experienced workmen to the mines, the outlook at the end of the year assumed a much brighter tint; however, some time will be required to readjust to normal.

Signal Modernization

Much old signaling equipment, such as relays, wiring and instrument cases, is in need of replacement. Therefore, typical modernization programs of automatic signaling in some instances include not only new signals, but also complete new control systems with modern coded track circuit apparatus.

Many programmed signaling installations, designed to increase operating efficiency, but which had to be held in abeyance because of material shortages, are being revitalized for action as essential to the reduction of running time in the face of intensive competition in both passenger and freight transportation. In pursuance of this objective of speeding traffic, much attention will also be given to the enlargement and rearrangement of yards and the installation of car retarders in the year ahead.

Manufacturers of signaling equipment have been hampered in completing equipment for many signal projects because of shortages of lead, brass, insulated wire, batteries, steel castings and numerous other vital components. In spite of these difficulties, they and the

railroads cooperated in completing many new projects during 1946.

Railway buying of shop machinery and tools set a fast pace last year. Heavy purchases of vertical boring mills, lathes, milling machines, planers, shapers, cranes and derricks have greatly improved the operating position of the railroads. For example, one road alone spent approximately \$3,800,000 for shop machinery, tools and other work equipment to modernize its facilities.

Purchases of mechanical material-handling equipment continued strong last year as many roads utilized lift trucks and other mechanical equipment as a means of expediting freight and baggage shipments. Hoists and tractors were also in heavy demand, owing to the need for replacing worn-out equipment and overcoming the pinch of labor shortages.

Reasonably fast delivery of this equipment prevailed throughout the year and now many manufacturers are able to offer 30- to 90-day deliveries. Engines, electric motors, generators and controls are the main concern of manufacturers. Purchases of mechanized work equipment in 1947 probably will exceed those of 1946 by a substantial margin.

Brighter prospects are in view for railway office appliances. Barring a continued serious steel shortage and unsettled labor conditions, high-volume

production seems a reasonable certainty in 1947. Manufacturers were fortunate in achieving an early and orderly reconversion from war to peace-time production. They now have an accumulated backlog of unfilled orders approximating \$300 million.

Among the major items in demand by the railroads are high-speed office equipment, including automatic ticket-vending machines, bookkeeping, duplicating, calculating, adding, card-punch tabulating, and addressing machines. In addition, the demand for microfilm and other photographic equipment used in speeding the delivery of freight shipments and other office procedures is expected to continue heavy throughout 1947.

Locomotive fire brick was relatively easy throughout 1946, but occasional embarrassment resulted from labor strife. Excluding "work stoppages," the outlook for prompt deliveries is good and no difficulties are anticipated in meeting railway demands.

Railway supplies of electric storage batteries were strictly limited last year because of the inadequacy of raw materials and increased demands by industry generally. However, all signs point to an improvement in receipt of raw materials and manufacturers expect an early rise in production. Early in December it was anticipated by one large manufacturer that, if labor difficulties

did not intervene, prospects for 1947 were certain to be somewhat brighter from the standpoint of more nearly meeting customers' requirements.

Water Chemicals Scarce

Shortages of water treating chemicals, especially soda ash, were encountered by numerous roads during 1946. Due to war-time demands, in addition to the normal requirements of soda ash for the manufacture of cleaning materials, glass, and many other products, the plants have operated at capacity for almost six years, without any breathing spell for repairs or for installing new equipment. This situation reached a point last year where shut-downs were imperative to make necessary repairs. In addition, the supply of this commodity has been further aggravated by labor difficulties and the scarcity of new equipment and replacements parts.

In addition to mechanical difficulties, the increased use of soda ash by manufacturers of aluminum and other products further complicated the supply picture. Deliveries are now averaging 45 to 60 days, and with new plant construction held to a minimum, and with the industry now producing at a rate estimated to be approximately 500,000 tons short of present requirements, first-half prospects are somewhat clouded. Replacement equipment should become available, however, in time to permit increased production during the latter part of 1947.

Confronted with a large amount of repair and construction work last year, some railway procurement officers were hard pressed to secure adequate supplies of cement. In addition to competing with one of the largest home building programs ever undertaken in this country, purchasing agents were also handicapped by production bottlenecks.

Deferred maintenance of manufacturing equipment has been a big headache for cement producers. Many machines that operated at capacity during the war have reached a stage where replacement parts must be obtained to assure continuation of the current high rate of production. While the acquisition of replacement parts has been the major bottleneck, labor turnover has also been heavy and inexperienced help has not improved the situation. In addition, the shortage of freight cars also has contributed to the dislocation of supplies. Despite these handicaps, cement producers are hopeful of producing 196 million barrels during 1947 against an estimated requirement of 173 million barrels.

The paint industry recognizes that its raw material problem is far from solution, yet it is hoping for improvement during 1947. The difficulty of obtaining raw materials is attributed

to the war's drain on supplies, former O. P. A. price ceilings and strikes. Some also blame these shortages on our diplomatic relations. It is claimed that Argentina, usually our best source of supply for flaxseed, is withholding this material because of strained relations. Linseed oil supplies are at a critical level and forecasts indicate that 1947 production will be far below actual needs. Castor oil, an important ingredient in the manufacture of synthetic enamels, is practically unobtainable; however, indications are that increased supplies will be available during the first six months of this year.

Glycerin, also used in the manufacture of synthetic enamels, is a major problem. World-wide shortages of this commodity are attributed to the diversion of oils and fats into edibles. Many countries which formerly exported oils, fats and glycerin are now importers. Copra and coconut oils from the Far East, another important source of glycerin, are still far below pre-war volume and, of the quantities received, a large portion is being ear-marked for human consumption. To a small degree, a substitute has been used for glycerin, but the production and the potential use of this product is limited.

Another problem is the shortage of steel shipping containers. Most industrial finishes are shipped in either 5-gal. cans or 55-gal. drums. The container shortage is more critical with respect to the 5-gal. cans because they are usable but once, whereas the 55-gal. drums are usually returned to the factory for refilling. Despite present handicaps, paint manufacturers are optimistic because the rising rate of industrial production indicates a continued demand for protective and decorative coatings.

Big Demand for Lumber

The chaotic condition of the lumber industry in general during 1946 presented one of the most perplexing problems among the many that faced railway procurement officers. While improvement was evident in some areas at the close of the year, the general complexion had changed but little, and the railways entered the new year with lumber as one of their major procurement problems. This condition is ascribed largely to the methods employed by the government in attempting to control prices and to enforce regulations; the exceptionally heavy demands for forest products by the home-building industry; labor shortages in both logging and milling operations; the "black market" reaction to price ceilings; and the difficulties experienced by mills in securing machinery, parts and materials.

Lumber production during the first

three-quarters of 1946 totaled 25,494,681 M. ft. b.m., a gain of approximately 13 per cent over the corresponding period of 1945. On the basis of these figures, the C. P. A. feels assured that its goal of 32 million M. ft. b.m. (or 16 per cent more than that produced in 1945) will be attained. Lumber inventories at sawmills and at concentration yards at the end of September aggregated 4,002,339 M. ft. b.m., an increase of about 7 per cent over the August stockpile, and 999,705 M. ft. b.m. more than the January 1, 1946, inventory. However, on the basis of the September balance it is estimated that an additional 3 million M. ft. b.m. is needed in the stockpile to permit orderly lumber distribution.

The Lumber Outlook

The general outlook for lumber indicates a limited supply by reason of the extraordinarily heavy demand for home building and industrial construction. A few roads report they succeeded in meeting most of their lumber requirements with comparatively little trouble last year but the majority classed lumber only one notch below their steel problem. Many roads, for example, found it extremely difficult to secure an adequate supply of heavy bridge timbers and car lumber, while others were handicapped by shortages in all classes of lumber. The chief procurement officer of a southern road expects less emphasis to be placed on the national housing program in the future; and although he states the removal of price control has disturbed the lumber market, he anticipates no difficulty in securing his requirements after prices have reached a level that will permit profitable production.

That many intricate and perplexing problems still face the railway lumber buyer is evident in a brief survey of lumber and timber production in the Northwest. Lumber production in this region during the first nine months of 1946 sagged 4.6 per cent below the output for the comparable period of 1945. This production drop is attributed to bad weather, labor shortages and lack of accessible stumpage. In addition, this region was handicapped by serious work stoppages and a shortage of equipment. Labor shortage is one of the matters of gravest concern confronting producers in this region. Absenteeism and bad weather conditions in the woods add to the difficulties of winter production and grave doubts have been expressed as to whether there will be any general easing of the situation during the first half of 1947.

At the close of the year, a shortage of clear lumber was seriously hampering the construction of new freight cars. An adequate supply of one-inch lumber

and clear stock for this work had become almost impossible to obtain. Car flooring had also reached the critical stage as many mills curtailed its production because of prohibitive price ceilings. Since the demise of O. P. A. ceilings an air of uncertainty has prevailed and it is expected that during 1947 there will probably be some price increases, but that supplies will be more in line with requirements.

Lumber manufacturers' problems in the South are largely of the same kind as those encountered on the West coast, with man-power one of the principal trouble spots. The disinclination of labor to go into lumber production and general labor inefficiency have been major problems. The scarcity of repair parts for machinery, trucks and tractors has also added to the producers' difficulties. The Southern pine market is strong and is dominated by an insistent demand for practically all grades that can be manufactured.

The greatest advance in prices of pine lumber since the removal of price ceilings was in the upper grades of finished and select items, but all grades have advanced from former levels. These advances are expected to remain through the first part of 1947, at least until after the spring rains, when production should show a substantial increase; then a gradual easing off due to an increased supply is possible. Hardwood lumber prices have remained fairly firm, the only exception being in some of the upper grades; at the same time there has been a slackening off in the demand for the lower grades.

Scarcity of creosote oil has been one of the main bottlenecks in the production of treated poles, although labor shortages in the woods and at treating plants, as well as replacement parts for equipment, have also been factors in many producing areas. The Rural Electrification Authority is still pushing its ambitious construction program and is expected to make heavy purchases this year. In general most railways were able to secure their pole requirements last year and, if an improved supply of creosote becomes available, the industry expects to be able to meet demands in 1947.

Crosstie Inventories Rise

For the most part, railway crosstie stocks and inventories held in producers' yards for treatment and delivery on specific orders are sufficient to insure a more satisfactory supply of crossties for renewal purposes during 1947. There are some exceptions in various territories, but from the present outlook production in general should be at a rate sufficient to take care of the carriers' immediate needs.

Rising crosstie inventories are one of the most heartening factors in the railway supply field. With an almost imperceptible general increase, beginning about August, 1945, inventories began to increase on a larger scale late in that year throughout the Midwest, the South, the Southwest and the East. By January, 1946, the rising inventories became pronounced and have persisted. Reports of procurement officers from various sections also indicate that the crosstie situation improved considerably during 1946 and all indications point to a more adequate supply for 1947.

One of the most disturbing factors in the crosstie picture is the shortage of creosote oil. Despite heavy coke production in this country and the resumption of creosote shipments from Great Britain, the shortage of this commodity persisted throughout 1946 and the second coal strike of the year further depleted the supply.

Up to late in December there had been no general increase in crosstie prices since the removal of price ceilings. However, prospects are that some price changes and adjustments will be made soon; also, it is expected that many railways will discontinue the purchase of certain species and will be willing to pay increased prices for the kind of ties they prefer.

One large tie producer backs his observations for the 1947 tie outlook by the statement: "We produced approximately 25 per cent more crossties last year than in 1945. Unless something unforeseen occurs we believe that we can produce as many in 1947 as we did in 1946. The standing timber is available, we have the necessary production machinery, and we do not expect the labor situation or the weather to get worse, so we see nothing at this time to prevent us from maintaining our present production rate."

More Switch Ties Needed

Unlike the crosstie situation, the general outlook for switch ties is complicated by several different factors. Many procurement officers hope to secure enough switch ties for immediate needs, but little improvement is expected by some roads. Switch-tie production throughout the country last year suffered from the general demand for lumber that brought far better prices than the ceilings established by the O. P. A. for switch ties.

Many Canadian treating plants processed more crossties, poles and lumber in 1946 than in any previous year, and except for the lack of labor and creosoted oil, would have surpassed previous records by a much greater margin.

Notwithstanding the achievement of the new production record, Canadian roads experienced difficulties similar to those encountered by railroads in the United States. Nevertheless, general conditions and stocks have improved substantially compared with the beginning of 1945, although in some producing areas production has declined sharply. However, the overall picture is good and, barring unusual labor difficulties and shortage of creosote, crosstie production during 1947 should be able to keep pace with demands.

Coal Supplies Inadequate

As a result of many complexities within the coal industry, the problem of maintaining an adequate coal supply was critical on many railroads throughout last year. Frequent "work stoppages" at the mines, combined with increased requirements of industry and the demands of the export program created a grave situation which reached a climax during the second coal strike of the year.

Production of bituminous coal during the week ended November 16, the last full week of November production, aggregated 12,500,000 tons compared with 11,513,000 tons mined during the comparable week of 1945. On the other hand, total production through November 23 amounted to approximately 483,086,000 tons, a drop of 6.9 per cent below that produced during the same period of the previous year.

Railway fuel purchases were curtailed seriously by strikes during the year and, consequently, the beginning of the November coal strike found the carriers' fuel stocks unprepared for this emergency. Their estimated fuel purchases during the first ten months of 1946 amounted to \$462,580,000, compared with \$461,484,000 for the same period of 1945; \$492,348,000 spent for fuel during the same ten months of 1944, and \$439,306,000 for this material during the comparable period of 1943.

Early in 1946 the O. P. A. started adjustments of maximum price schedules in the various coal-producing districts and raised the maximum price of railroad fuel an average of approximately 18 cents a ton. This was done, it was explained, to offset increased operating costs brought about by a wage increase granted shortly after the federal government assumed control of the coal mines to bring about a settlement of the walk-out.

During the first eight months of last year the railways consumed 66,456,282 tons of coal, an increase of 26.8 per cent over the 52,424,282 tons used during the comparable period of 1940. At the same

(Continued on page 86)

A Review of Railway Operations in 1946

TRANSITION from war to normal peace-time activity is usually characterized by lowered levels of industrial output while industry reconverts, by a short supply of goods in relation to demand, by rising prices and labor unrest, and by other disturbing influences. The year 1946 was no exception to that general rule, experiencing most of the ills that follow in the wake of war, although weaving its own pattern in keeping with political and economic conditions of the times.

Had it not been for strikes and work slow-downs in 1946, the reconversion period following the second World War probably would have been the shortest and most satisfactory in history. Demobilization of the armed forces was effectively carried out. Employment continued at record peace-time levels. Retooling of industry was accomplished in a remarkably short period of time. But these favorable factors were largely offset by persistent work stoppages growing out of exorbitant wage and working demands. The American people expressed their disapproval of the situation at the polls in November, also in their reaction to the second strike in the bituminous coal fields which began on November 20.

The railroad industry in 1946 felt the effects of these transition factors, both directly and indirectly. Railroad enginemen and trainmen walked off their jobs on May 23 and for two days railroad operations were at a virtual standstill. This was the first national railroad strike in nearly a quarter of a century. Even more crippling to railroad operations were the two coal strikes, because of the length of time involved. The first of these began on April 1 and extended to May 29, with a 2-week "truce" period from May 13 to May 27. The second began on November 20 and extended to December 7. Passenger train operations were curtailed during these periods and embargoes on freight shipments were invoked.

Strikes in other industries also affected railroad operations, reducing and unbalancing traffic, and slowing down the delivery of new equipment and materials and supplies. These included the automobile, steel, meat packing, electrical supply and maritime strikes, as well as hundreds of other general, local, and jurisdictional strikes.

Railroad traffic in 1946 was about midway between the pre-war and war peaks. Freight ton-miles were 20 per cent below the 1944 war peak and 14 per cent below 1945, but were above

By **DR. J. H. PARMELEE**

Director
Bureau of Railway Economics
Association of American Railroads

the 1929 pre-war high by 30 per cent. Passenger-miles dropped 32 per cent below 1944, and 29 per cent below 1945, but were 39 per cent greater than in 1920.

Notwithstanding this greatest volume of peace-time traffic in history, railroad net earnings were little better than those of the depression years that preceded the war. Sharply increased wage rates and prices of fuel, material and supplies narrowed the margin between revenues and expenses to the lowest relative point since 1920. In the 57 years for which Interstate Commerce Commission records are available, the operating ratio has exceeded that of 1946 in only two years—1919 and 1920. In those two years, the railroads were under government control or were operated under government guaranty.

Railroad wage increases of 16 cents per hour were awarded early in April, retroactive to January 1. This increase of about 17 per cent (later raised to nearly 20 per cent), together with two

previous wage increases during the war (in 1941 and 1943), and substantial price increases since 1940, foreshadowed an increase in operating costs of nearly two billion dollars in 1946.

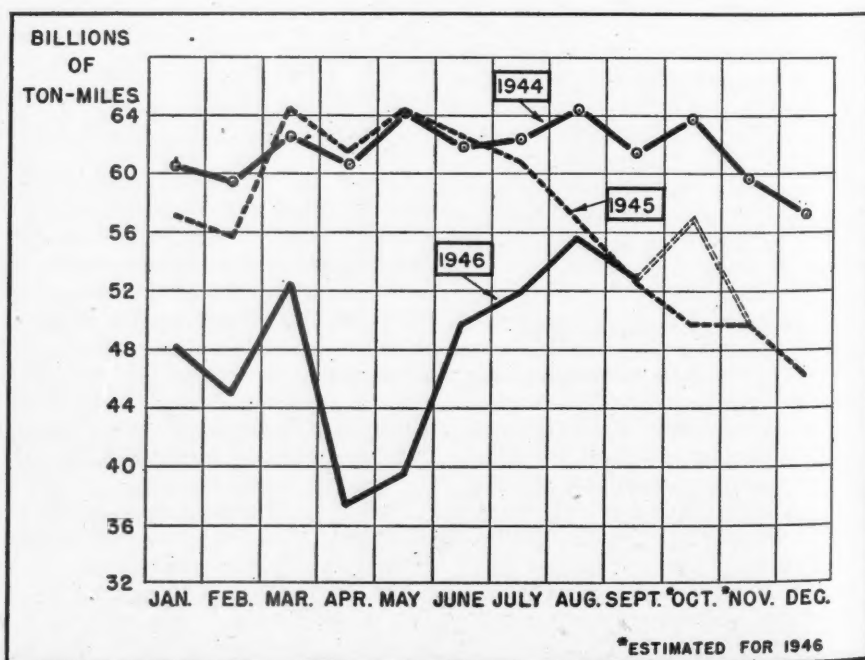
In view of the seriousness of the situation thus facing them early in 1946, the railroads on April 15 petitioned the Interstate Commerce Commission for authority to increase freight rates by between 19 and 20 per cent, on the average. The revenue to be derived from the increase thus sought was estimated at about a billion dollars per year.

After brief hearings in May, the commission on June 20 authorized a small interim increase, effective July 1, 1946, which added about \$170 million, or 6 per cent, to freight revenues in the latter half of the year.

After further and more extended hearings in July, August and September, the commission handed down its final decision on December 5. The freight rate increases authorized, including the interim increases of July 1, approximated 17.6 per cent, estimated by the carriers on the basis of 1947 operations at \$970 million, inclusive of the \$170 million already awarded on July 1.

Since the filing of the carriers' original petition in April, further substantial increases in operating costs have taken

**Chart A—Revenue Ton-Miles, By Months—Class I Railways
1944, 1945 and 1946**



the war
ostantial
adowed
f nearly

he situ-
n 1946,
ned the
ion for
ates by
on the
derived
as esti-
ars per

he com-
a small
1, 1946,
or 6 per
e latter

ed hear-
tember,
ts final
freight
ing the
ximated
carriers
at \$970
million

s' origi-
stantial
e taken

ys

C.

6

4, 1947

place. Final settlement of the wage dispute toward the end of May added 2½ cents per hour to wage rates, on top of the 16 cents previously awarded. In July, the Crosser Act was enacted, which increased the rate of payroll tax paid by railroad employers from 6½ per cent to 8¾ per cent, effective January 1, 1947. Prices of fuel, materials and supplies have advanced 7½ per cent since April. In all, these three factors will add close to \$300 million to operating costs in 1947. Other factors in the situation are (1) expiration of excess profits carry-back tax credits, which returned probably as much as \$150,000,000 to the railroads in 1946; and (2) prospective continuing decline in railroad passenger traffic in 1947, estimated to reduce passenger revenue by perhaps as much as \$300 million below 1946.

The total of cost increases since 1940, outlined above, is \$2,224 million. Against this increase in annual costs, freight revenues in 1947, it is hoped, will experience an increase of \$970 million as the result of the final rate increase, or \$800 million in addition to the \$170 million already received during the last six months of 1946.

Carrying these various cost factors forward into 1947, the summarized picture is approximately as follows, stated in millions of dollars.

Increased costs, based on status of April 15, 1946

| | |
|--|---------|
| Due to wage increases of | |
| 1941 | \$370 |
| 1943 | 343 |
| 1946 (16 cents) | 598 |
| | \$1,311 |
| Payroll tax on wage increases | 79 |
| Cost of vacations with pay | 77 |
| | \$1,467 |
| Due to increased prices, 1939 to April, 1946 | 461 |
| | \$1,928 |

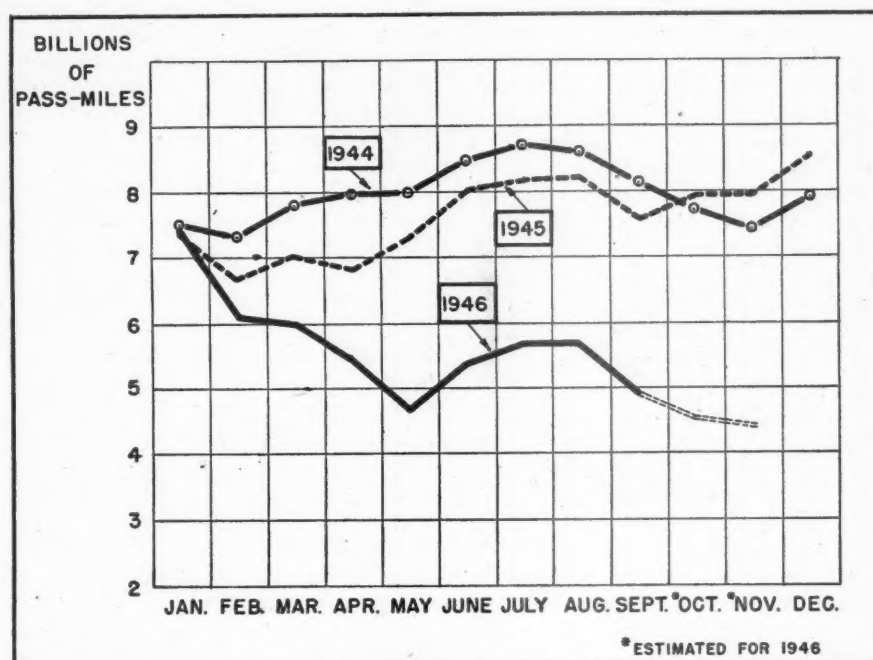
| | |
|--|-------|
| Further increases, to December 31, 1946 | |
| Supplemental wage increase of 2½ cents .. | \$93 |
| Payroll tax on wage increase | 6 |
| Crosser Act tax increase of 2¼% on total payroll | 90* |
| Price increases, April to December, 1946 .. | 107 |
| | \$296 |

* Effective January 1, 1947.

Thus the problem confronting the railroads is to absorb the difference between \$2,224 million of increased annual costs and an addition of \$970 million to freight revenue from increased rates, to absorb further losses in passenger revenue due to declining traffic, and at the same time to produce an adequate amount of net earnings.

Stating the same problem in somewhat different terms, the railroads since 1940 have experienced increases of more than 50 per cent in wage rates and in the unit costs of materials; their own price for transportation service rendered has increased by an average of 17.6 per cent on freight traffic and 10 per cent on passenger traffic. The

Chart B—Revenue Passenger-Miles, By Months—Class I Railways—1944, 1945 and 1946



spread thus created between costs to be met and prices charged for service can be bridged, if at all, only by maintaining traffic levels well above those of 1940 and by the greatest possible application of economy and efficiency to railroad operation.

Railroads made some progress in 1946 in the rehabilitation of their facilities, although the work was retarded by prevailing conditions. New equipment installations during the first 11 months included 37,219 freight cars and 480 locomotives. Equipment on order on December 1, 1946, numbered 63,616 freight cars and 564 locomotives. Passenger train cars installed in the first 10 months totaled 363, with 2,413 additional cars on order November 1. When this new equipment becomes available, and when it becomes possible to carry out other modernization plans, railroad service will attain the level of post-war efficiency contemplated by the industry.

The death of John J. Pelley in November saddened the whole railroad community. After many years of service for individual railroad companies, including the Illinois Central, Central of Georgia and the New Haven, Mr. Pelley in 1934 became the first president of the Association of American Railroads. In this position he earned the respect of the public, including its official arm at Washington. He contributed with distinction to the cooperative war effort of the military and naval branches, the commission and the Office of Defense Transportation, the War Production Board and the railroads.

Legislation

The Railroad Social Insurance Bill, also known as the Crosser Bill, was the only important piece of legislation affecting the railroads enacted during the second session of the 79th Congress. It was signed by the President on July 31, 1946.

This comprehensive amendment of the Railroad Retirement and Railroad Unemployment Insurance acts raised the payroll tax rate to be paid by employees from 3½ per cent to 5¾ per cent and the rate to be paid by employers (who alone pay the unemployment payroll tax of 3 per cent) from 6½ per cent to 8¾ per cent, effective January 1, 1947. These rates are to be increased by ¼ per cent each for employers and employees, on January 1, 1949, and January 1, 1952, respectively.

The act creates a new system of annuities for survivors of railroad employees, increases the benefits payable under the unemployment insurance system, and makes the further radical change of applying the same schedule of benefits for unemployability due to sickness or injury from whatever cause, and even to maternity. The bill was vigorously opposed by railroad representatives, and by other interests as well, at congressional hearings.

The Bulwinkle Bill, designed to harmonize the national transportation policy and the policy of the antitrust laws, passed the House but failed to reach the floor of the Senate as the result of a filibuster. The bill, if enacted into

law, would have clarified the situation regarding the right of the railroads to employ the conference method of making rates, which has been under attack by the Department of Justice. Shipper representatives strongly and extensively supported the bill, as did the commission and many other bodies.

President Truman vetoed the railroad reorganization bill (Reed Bill) after it had been passed by both Houses of Congress on July 31, 1946. His veto message stated that the measure would not accomplish the purpose for which it was intended—namely, to eliminate inequities in the present reorganization laws. At the same time, he expressed sympathy with its general aims, and indicated the hope that a bill more in line with his views could be formulated.

A bill to approve the 1941 agreement between the United States and Canada for construction of the St. Lawrence navigation and power project was reported out by the Senate committee on foreign relations but did not come up for a vote in the Senate. Other bills of interest to the railroads introduced in the final session of the 79th Congress but not enacted into law included bills designed to increase the minimum wage established under the Fair Labor Standards Act, to regulate train dispatching, and to amend the Employers' Liability Act.

Court and Administrative Action

The status of the antitrust suit brought by the Department of Justice against the Association of American Railroads, the Western Association of Railway Executives, and others changed little during the year. The government filed a bill of particulars on October 22, 1945, to which the defendants filed answers on March 3, 1946. No date has been set for taking of evidence.

The special master appointed by the Supreme Court in connection with the Georgia Antitrust Case received evidence during the spring and summer of 1946 from the state of Georgia and the railroads. Briefs in the case are to be filed by February 24, 1947, with reply briefs due on March 11. Arguments before the master will begin on the later date.

The Class Rate Case (I. C. C. Dockets 28300 and 28310) has been assigned for argument before the Supreme Court on February 10, 1947. The commission's decision in this case, handed down on May 15, 1945, ordered an increase of 10 per cent in class rates in Official territory and a reduction of 10 per cent in other territories east of the Rocky mountains, as an interim measure. The decision further required

the railroads at a later time to establish a uniform freight classification for all parts of the United States and to establish a uniform scale of class rates in territories east of the Rocky mountains. The federal district court in northern New York granted an interlocutory injunction enjoining enforcement of the order. This was appealed to the Supreme Court where it awaits hearing.

In December, 1945, a special federal court in Philadelphia approved the offer of a group of railroads to buy the sleeping car business of the Pullman Company. This decision was appealed by the government and certain private interests. No date has been set for hearing of the matter by the Supreme Court.

The Federal Power Commission completed its investigation into the matter of the conservation and use of natural gas, after extensive hearings held throughout the country. The commission has not yet completed its report to Congress in the matter.

The Interstate Commerce Commission on its own motion instituted an investigation of the appliances, methods, and systems intended to promote safety of railroad operation. Hearings were held on October 2 and 3, and briefs were filed on November 20. The notice of the hearing specified that if an order of general application is entered any individual respondent will, upon request, be granted a further hearing.

Employment and Wages

Railroad employment in 1946 averaged 60,000 fewer jobs than in 1945, but was greater than in any of the years 1931 to 1944, inclusive. The decrease was from 1,420,000 employees in 1945 to 1,360,000 in 1946.

The railroad payroll in 1946 aggregated \$4,200 million, the greatest in railroad history. With employment of 60,000 fewer workers in 1946 than in 1945, the payroll in 1946 was \$338 million greater. The greater payroll for 1946 was due to the wage increases granted during the year.

Average straight time rate of pay crossed the dollar mark in 1946 for the first time, being \$1.12 per hour. The straight time rate in effect in 1945 averaged 93.3 cents per hour and in 1940 averaged 74.2 cents per hour. The average straight time rate paid in 1946 was more than one and one-half times that of 1940.

Annual earnings of railroad employees also reached new highs in 1946. Average compensation per employee in 1946 approximated \$3,090, compared with \$2,721 per employee in 1945, and \$1,913 in 1940.

Table I shows, for 1946, for the preceding seven years, and for 1929, the average number of employees of railroads of Class I, the total payroll, compensation per employee per year, and the average straight time rate of pay per hour. The mounting burden of wages during and following the war is made very clear from these data.

Table I—Employees and Compensation

| Year | Average number | Total payroll (millions) | Compensation per employee per year | Average straight time rate per hour (cents) |
|------|----------------|--------------------------|------------------------------------|---|
| 1946 | 1,360,000 | \$4,200 | \$3,090 | 112.0 |
| 1945 | 1,419,505 | 3,862 | 2,721 | 93.3 |
| 1944 | 1,414,776 | 3,858 | 2,727 | 93.0 |
| 1943 | 1,355,114 | 3,521 | 2,598 | 89.3 |
| 1942 | 1,270,687 | 2,932 | 2,307 | 83.5 |
| 1941 | 1,139,925 | 2,332 | 2,045 | 76.9 |
| 1940 | 1,026,848 | 1,964 | 1,913 | 74.2 |
| 1939 | 987,675 | 1,863 | 1,887 | 74.0 |
| 1929 | 1,660,850 | 2,897 | 1,744 | 65.8 |

At the beginning of 1946, the railroads had before them demands for wage increases and changes in working rules. On January 26 carrier representatives and 18 of the 20 standard railroad labor unions—all except the Brotherhood of Locomotive Engineers and the Brotherhood of Railroad Trainmen—agreed to arbitrate the wage dispute, the demands for rules changes being deferred by all except the trainmen and the engineers.

Two arbitration boards were appointed, one for the non-operating group of employees (15 unions), the other for the three operating unions which agreed to arbitration. Hearings before these two boards started simultaneously on February 18. The two boards on April 3, 1946, awarded an increase in existing basic rates of pay in the amount of 16 cents per hour, retroactive to January 1, 1946.

While these arbitration proceedings were in progress, President Truman on March 8 appointed an emergency board to investigate the wage and rules dispute between the carriers and the trainmen and engineers. This board convened on March 12 and concluded hearings on April 8. On April 18 the board recommended the same retroactive increase of 16 cents per hour in basic rates as had been awarded by the two arbitration boards to other employees, and outlined certain principles to be followed with respect to further negotiations on the rules proposals.

Meanwhile, the 18 unions awarded increases by the arbitration boards expressed dissatisfaction with the amount of the awards. The non-operating group served notice on April 15, and the three operating unions served notice on May 3, for an additional increase.

The Brotherhood of Locomotive Engineers and the Brotherhood of Railroad Trainmen on April 25 rejected the emergency board findings and called a nation-wide strike to begin at 4 p. m., May 18. At the request of President

the pre-
1929, the
s of rail-
roll, com-
year, and
te of pay
burden of
the war is
ata.

compensation
Average
straight
time rate
per hour
(cents)
112.0
93.3
93.0
89.3
83.5
76.9
74.2
74.0
65.8

the rail-
for wage
ing rules.
representatives
oad labor
erhood of
Brother-
agreed to
demands
ed by all
engineers.
were ap-
ng group
other for
ch agreed
ore these
ously on
on April
in exist-
mount of
e to Jan-

proceedings
uman on
cy board
ules dis-
the train-
ard con-
led hear-
the board
ctive in-
in basic
the two
employees,
s to be
er nego-

awarded
ards ex-
amount
ng group
the three
on May

ative En-
Railroad
ected the
called a
4 p. m.,
resident

y 4, 1947

Truman, negotiations between the parties were resumed, but without result. On May 17 the President issued an executive order directing J. Monroe Johnson, director of the Office of Defense Transportation, to take over and operate the railroads for the United States government, and on the following day the strike was postponed for a period of five days—until the same hour on May 23.

On May 22, President Truman suggested as a basis of settlement an additional increase of 2½ cents per hour, in lieu of changes in working rules, with the further suggestion that any such changes in rules be tabled for at least a year. This suggestion was accepted by the carriers and the 18 unions. However, the engineers and trainmen refused to accept and on May 23 the strike became effective.

On the afternoon of May 25, two days later, the strike of the engineers and trainmen was called off and the men returned to work, agreeing to accept the settlement proposed by the President. This acceptance highlighted a dramatic moment in history, being announced by the President to Congress in the course of his address to that body, containing recommendations for drastic legislation to meet the grave national emergency the strike had already produced.

The agreement provided for a total increase of 18½ cents an hour, 16 cents being retroactive to January 1, and the remaining 2½ cents effective on May 22.

The strike settled, government control of the railroads was relinquished on May 26, at 4 p. m.

The wage increase, calculated on the basis of 1946 employment, added \$680,000,000 per year to railroad payrolls, and the increase in payroll taxes on account of the wage increase added \$41,460,000 per annum.

Rates and Fares

As a result of declining traffic and increasing costs, the railroads filed a petition with the Interstate Commerce Commission on April 15, 1946, seeking authority to increase freight rates and charges and to maintain passenger fares and charges at existing levels.

The freight rate increase sought was 25 per cent, with certain exceptions on coal, coke, iron ore, iron and steel products and other commodities. The proposed increases averaged between 19 and 20 per cent.

The petition further requested permission to make the proposed increases effective on May 15, 1946, upon one day's notice, in advance of final disposition of the matter.

The commission refused this final request, but set May 6 for hearings on the emergency features of the petition.

Ex Parte No. 148 was reopened for further hearing and the new petition was docketed as Ex Parte No. 162. On June 20 the commission authorized interim increases in freight rates averaging about 6 per cent, effective July 1. These increases consisted of those authorized in Ex Parte No. 148 but suspended on May 15, 1943, plus certain additional increases on coal and ore and an additional increase of 5 per cent in Official territory.

Further hearings were held during July and August in Chicago, Buffalo, Atlanta, Salt Lake City, and Houston, with a final hearing in Washington in September. Briefs were filed in October and the commission handed down its final decision on December 5. This decision cancelled the July 1 interim increases, and authorized increases in freight rates averaging about 17.6 per cent for the country as a whole. The new freight rates went into effect January 1, 1947, and are estimated to produce added revenue of \$970 million in 1947, or \$800 million more than the \$170 million derived in the last 6 months of 1946 from the interim increases of July 1.

Generally speaking the commission authorized increases of 20 per cent on commodities for which the carriers had asked 25 per cent. Agricultural products and live stock, for the most part, were increased only 15 per cent, while accessorial charges received the full 25 per cent increase. Excepted commodities in the original petition were treated somewhat differently, with greater increases for coal and iron and steel products than were requested, but with no increase allowed on iron ore moving to upper lake ports.

The 10 per cent increase in passenger fares granted in Ex Parte No. 148, effective February, 1942, was scheduled to expire six months after legal termination of the war. The carriers in their original petition requested that this increase be continued without expiration date, and the commission in its decision of December 5 acceded.

The commission on October 28 handed down a decision on a petition filed by the Railway Express Agency to increase express rates, docketed as Ex Parte No. 163. The commission authorized the increases sought for a period of one year, with the provision that the Express Agency should make and report to the commission, within 6 months after the effective date of the new rates (December 13), a study of the effect of the new rates. At the same time, the Express Agency was directed to file its proposals for permanent rates.

The increased express rates will increase the revenues of the Express Agency by about \$58,000,000 per year. Such additional revenue is expected to

meet the increased costs of operation incurred by the Agency, including wage and price increases, but will not cover the increased costs to the railroads of handling express cars.

The Office of Defense Transportation continued to function with a considerably reduced force, under the direction of Col. J. Monroe Johnson, a member of the Interstate Commerce Commission. The original plan, which called for liquidation of the office on June 30, 1946, was modified because of emergencies created by the coal and rail strikes, as well as the continued heavy demand for freight cars. Colonel Johnson recommended an extension for another ten months—until April 30, 1947, which was approved when President Truman signed H. R. 6885, the Third Deficiency Bill, on July 23.

The O. D. T. was active in both coal strikes, as well as during the rail walk-out. On Friday, May 17, President Truman signed an Executive Order directing Director Johnson to take over the nation's railroads and operate them in the name of the United States government, as a result of the strike called by the railroad engineers and trainmen. Charles H. Buford, executive vice-president of the Chicago, Milwaukee, St. Paul & Pacific, was appointed by Colonel Johnson as federal manager of the government-controlled roads. The strike, which became an actuality on May 23, was fortunately of short duration, and on May 26 Colonel Johnson announced the termination and relinquishment of control of the 337 railroads involved.

The major coal strikes in both spring and fall created equally serious emergencies, and found both the O. D. T. and the commission issuing orders curtailing passenger transportation and taking other measures deemed necessary for the conservation of coal.

At the end of 1946 there were 70 railroad companies operating 35,519 miles of road in the hands of receivers and trustees. This was two less than the total at the end of 1945. Of the total number in the hands of the courts, two Class I and eight smaller roads were in the hands of receivers, while 21 Class I and 39 smaller roads were in the hands of trustees. The only change during the year was the emergence of the Seaboard Air Line, a Class I carrier, and the Virginia & Truckee, a Class II carrier, from receivership.

Railroad Credit Corporation

This corporation on November 15 distributed \$360,822 to its participating carriers, making a total return of 100 per cent of the amounts originally contributed by such carriers, or \$73,329,458. Of this total, \$44,565,022 was paid in cash, and the remainder, \$28,-

764,436, was credited on loans. The corporation is now in process of liquidation.

Railroad Retirement Board

Railroad Retirement—Railroad retirement operations in 1946 were affected by the termination of the war. From a total of 174,930 monthly benefits in force as of October 31, 1945, the number rose sharply to 188,774 on the corresponding date in 1946. This represents a net increase of 13,844 beneficiaries on the rolls of the Railroad Retirement Board between those dates, resulting from an increase of 16,226 in the number of annuitants awarded benefits under the Retirement Act and a decline of 2,382 beneficiaries by reason of deaths among the group of pensioners (persons transferred from the voluntary rolls of the carriers in 1937).

Comparison of this increase in beneficiaries with the increase occurring between corresponding periods of previous years is made in the following tabulation.

| | 1946 over 1945 | 1945 over 1944 | 1944 over 1943 |
|--------------------------|----------------------|----------------------|----------------------|
| As of October 31 | | | |
| Increase in annuitants.. | 16,226 | 10,548 | 7,495 |
| Decrease in pensioners.. | 2,382 | 2,592 | 3,293 |
| Net increase | 13,844 | 7,956 | 4,202 |

Total benefit disbursements during the month of October, 1946, aggregated \$13,592,344, compared with \$12,435,717 during October, 1945. Thus the annual level of disbursements rose from \$149,229,000 in October, 1945, to \$163,108,000 in October, 1946, an increase of \$13,879,000. The corresponding increase between October, 1944, and October, 1945, was \$8,141,000, and between 1943 and 1944 was only \$6,437,000.

Despite some decrease in railway employment in 1946, tax accruals for railway retirement amounted to \$114,167,000 for the first 10 months of 1946, compared with \$100,547,000 for the corresponding period of 1945, an increase of 13.5 per cent. This increase was attributable to the dual factors of increased wage rates and an increase in the payroll tax rate for retirement purposes, which was raised from 3¼ per cent to 3½ per cent on January 1, 1946.

The financial operations of the railroad retirement system from 1937, when the Railroad Retirement Act became effective, to October 31, 1946, are summarized in the following tabulation.

| | |
|-------------------------------|-----------------|
| Tax accruals | \$1,895,000,000 |
| Interest | 62,588,167 |
| | \$1,957,588,167 |
| Less: | |
| Benefit payments.. | \$1,173,344,027 |
| Administrative expenses | 27,768,892 |
| | 1,201,112,919 |
| Balance | \$756,475,248 |

The foregoing balance does not represent the actual balance to the credit of the Railroad Retirement Account, inasmuch as amounts transferred to that account from congressional appropriations (rather than tax collections) are considered basic assets, and administrative expenses are not charged against the fund, but are met from appropriations by Congress for that specific purpose. The actual balance in the account as of October 31, 1946, was \$816,308,140.

Railroad Unemployment Compensation—Payments of railroad unemployment insurance benefits in 1946 rose to higher levels than in any year since inauguration of the system in 1939. Benefit disbursements during the 10 months ended October 31, 1946, aggregated \$31,627,090, compared with \$1,026,698 for the same period of 1945. The total number of benefit certifications in 1946 were 28½ times those of 1945, and benefit disbursements were more than 30 times as great. The relatively greater increase in disbursements than in certifications was due in part to payments at the new \$4.50 and \$5.00 daily benefit rates which became effective with the amendments enacted July 31, 1946.

Unemployment insurance tax accruals for the first 10 months of 1946 amounted to \$97,858,000, compared with \$92,812,000 for the corresponding period of 1945. Since benefit disbursements in 1946 amounted to slightly less than one-third of unemployment insurance tax accruals, the balance to the credit of the unemployment insurance reserve continued to grow. The actual balance to the credit of the reserve as of October 31, 1946, amounted to \$788,352,192.

A brief summary of the financial results of operation of the unemployment insurance system, for the entire period of operations from July 1, 1939, to October 31, 1946, is shown below:

| July 1, 1939 to Oct. 31, 1946 | |
|---|---------------|
| Receipts: | |
| Net tax contributions.. | \$651,280,516 |
| Transfers from state accounts | 106,978,709 |
| Transfers from administrative fund..... | 56,863,835 |
| Interest on investments ... | 51,193,434 |
| | \$866,316,543 |
| Expenditures: | |
| Net benefit payments.. | 77,947,319 |
| Reimbursements to states | 17,033 |
| | 77,964,351 |
| Balance or reserve..... | \$788,352,192 |

* Includes \$50 in fines and penalties collected.

The item of net tax contributions shown in the foregoing summary represents 90 per cent of the total tax collections, the remaining 10 per cent being transferred to the administrative fund. Administrative expenses for the entire period of operation, from July

1, 1939, to October 31, 1946, amounted to \$25,790,196.

While unemployment insurance operations increased sharply during 1946, operations of the Railroad Retirement Board's employment service, conversely, showed a precipitous decline. Placements made by that service declined progressively after V-J Day, and averaged only 10,182 per month for the first 10 months of 1946, compared with an average of 71,610 per month for the corresponding period of 1945.

Traffic Trends

Unless otherwise specified, all railroad statistics in this review relate to railways of Class I. Generally speaking, the statistics are derived from reports of the Interstate Commerce Commission. Carloading statistics and certain other data are based upon records of the Association of American Railroads.

Table II shows comparative statistics of revenue freight and passenger traffic in each year from 1939 to 1946, and for certain earlier years.

Table II—Comparative Traffic Summary

| Revenue carloadings (in thousands) | | | |
|---------------------------------------|---------|-----------|---------|
| 1946..... | 41,250 | 1941..... | 42,352 |
| 1945..... | 41,901 | 1940..... | 36,358 |
| 1944..... | 43,408 | 1939..... | 33,911 |
| 1943..... | 42,440 | 1933..... | 29,220 |
| 1942..... | 42,771 | 1929..... | 52,828 |
| Revenue ton-miles (in millions) | | | |
| 1946..... | 583,000 | 1941..... | 475,072 |
| 1945..... | 681,001 | 1940..... | 373,253 |
| 1944..... | 737,246 | 1939..... | 333,438 |
| 1943..... | 727,075 | 1933..... | 249,223 |
| 1942..... | 637,984 | 1929..... | 447,322 |
| Revenue passenger-miles (in millions) | | | |
| 1946..... | 65,000 | 1941..... | 29,350 |
| 1945..... | 91,717 | 1940..... | 23,762 |
| 1944..... | 95,549 | 1939..... | 22,651 |
| 1943..... | 87,820 | 1933..... | 16,641 |
| 1942..... | 53,659 | 1929..... | 46,849 |

Revenue carloadings—Total loadings of revenue freight in 1946 are estimated at 41,250,000 cars, a decrease of 651,000 cars, or 1.6 per cent, under 1945. Carload traffic declined 3.9 per cent, while l. c. l. shipments showed an increase of 14.2 per cent.

Loadings for each of the eight general commodity groups in 1946 are shown in Table III, together with the increase (I) or decrease, compared with 1945.

Table III—Carloadings by Commodity Groups

| | 1946 (000) | Decrease under 1945 | |
|------------------------------|---------------|---------------------|----------|
| | | Number (000) | Per cent |
| Merchandise, L.C.L.... | 6,311 | I 785 | I 14.2 |
| Forest products | 2,269 | I 230 | I 11.3 |
| Live stock | 949 | I 55 | I 6.2 |
| Miscellaneous | 18,686 | 559 | 2.9 |
| Coal | 7,920 | 374 | 4.5 |
| Grain & grain products | 2,475 | 259 | 9.5 |
| Ore | 2,063 | 412 | 16.6 |
| Coke | 577 | 117 | 16.9 |
| Total | 41,250 | 651 | 1.6 |

Three of the eight commodity groups showed increases in 1946 loadings, while five showed decreases. Loadings of

amounted
nce opera-
ing 1946,
retirement
onversely,
e. Place-
lined pro-
averaged
e first 10
an aver-
the cor-

all rail-
relate to
speaking,
a reports
mission.
in other
the As-
ds.
statistics
er traffic
, and for

Summary
(ds)

42,352
36,358
33,911
29,220
52,828
475,072
373,253
333,438
249,223
447,322
29,350
23,762
22,651
16,641
46,849

loadings
estimated
of 651,
er 1945.
er cent,
an in-

ht gen-
1946 are
with the
red with

modity

nder 1945

Per cent
I 14.2
I 11.3
I 6.2
2.9
4.5
9.5
16.6
16.9
1.6

groups
s, while
ngs of

4, 1947

less-carload merchandise, forest products and live stock increased, while loadings of coal, grain and grain products, miscellaneous manufactures, coke, and ore decreased. Grain loadings, although off from the 1945 peak, were heavy throughout the year. Coal loadings, except for the two strike periods, were also exceptionally heavy. Termination of the war exerted a sharp downward effect on both coke and ore movement.

Revenue ton-miles—Because of declines in average length of haul per ton from the abnormal war-time high, and in average load per car, ton-miles of freight in 1946 showed a greater relative decline than did carloadings. The aggregate for 1946 was estimated by the carriers in 1946 at 583 billion, and that estimate is here utilized, although it may be slightly exceeded in actual experience. This aggregate was 14.4 per cent below 1945 and 20.9 below 1944. It was, however, 30.3 per cent greater than that of 1929, and 74.8 per cent above 1939.

The trend in ton-miles since the end of the war is shown in Table IV, which gives figures by quarterly periods beginning with 1944.

Table IV—Railroad Ton-Miles
(in Billions)

| | 1944 | 1945 | 1946 |
|-------------------|-------|-------|-------|
| 1st quarter | 182.5 | 176.6 | 145.7 |
| 2nd quarter | 186.1 | 188.1 | 126.7 |
| 3rd quarter | 187.9 | 170.1 | 160.7 |
| 4th quarter | 180.4 | 145.8 | 150.0 |

Ton-miles reached their lowest point in the transition period during the second quarter of 1946, being 31.9 per cent, or nearly one-third, below the corresponding quarter of 1944. The coal, railroad and other strikes in progress at that time represented the major factor in the decline. The third quarter of 1946 was comparatively free of strikes, with the result that ton-miles showed a decrease of only 14.5 per cent below the corresponding months of 1944 and were only 5.5 per cent under the same period of 1945. The 17-day coal strike in the fourth quarter of 1946 somewhat retarded the upward trend in ton-miles which got under way in the third quarter.

Chart A shows the monthly trend in ton-miles during 1944, 1945 and 1946. It shows clearly the downward trend that set in following V-E Day in May, 1945, the effect of the coal and railroad strikes in April and May, 1946, and the change that took place in mid-year of 1946.

Passenger-miles—The peak of the return movement of troops from overseas was reached in December, 1945, and January, 1946, and rail movement of service personnel declined rapidly thereafter. Passenger-miles for the year 1946 approximated 65 billion, a decline of 29.1 per cent below 1945 and 32 per

cent below 1944. The 1946 volume was, however, the greatest for any peacetime year, exceeding the pre-war high of 1920 by 38.7 per cent, and being nearly three times the 1939 volume.

The downward trend in passenger-miles following the peak of the return movement of troops has been sharp and continuous, as shown in Table V and Chart B. Table V shows the figures by quarterly periods for 1944, 1945 and 1946, while Chart B gives the monthly trend during the same years. Restricted passenger-train operations during the two coal strike periods contributed to the decline in passenger-miles.

Table V—Railroad Passenger-Miles
(in Billions)

| | 1944 | 1945 | 1946 |
|-------------------|------|------|------|
| 1st quarter | 22.7 | 21.1 | 19.5 |
| 2nd quarter | 24.4 | 22.2 | 15.6 |
| 3rd quarter | 25.4 | 24.0 | 16.4 |
| 4th quarter | 23.2 | 24.5 | 13.6 |

The downward trend in passenger-miles seems likely to continue throughout 1947, possibly longer. This declining trend is one of the primary factors to be considered in appraising the railroad future.

The Competitive Situation

The war brought about material changes in the competitive transportation situation. For a period of 15 years or more prior to the war, traffic was being diverted in ever increasing volume away from the railroads to other, and more or less subsidized, agencies of transport. When the war came there was a shift in traffic back to the railroads, as other agencies for one reason or another could not handle the load.

Since the end of the war, the tendency has been toward a return to pre-war conditions in the competitive field, although certain factors have retarded the trend. In the passenger field, scheduled air lines soon resumed the spectacular rate of pre-war growth in passenger-miles performed. Those carriers performed one billion passenger-miles of service for the first time in 1940. In 1945, the figure was 3½ billion passenger-miles. In 1946 it almost certainly exceeded five billion, and may have gone as high as six billion. The private passenger automobile is returning in pre-war numbers to the highways, although retarded by the limited number of new cars available in relation to demand. The intercity motor bus, like the railroads, experienced a decline in passenger traffic in 1946, but the rate of decline was not nearly so great as in the case of the rail carriers. It seems unlikely that the sharp pre-war rates of increase in bus travel will be resumed in the post-war period.

In the freight field, domestic waterborne traffic showed an increase in 1946 by reason of the partial return to service of coastal and intercoastal vessels. While data on inland waterborne commerce are not available at this time, it is believed that traffic over the Great Lakes and inland rivers and canals was less in 1946 than in 1945. For-hire trucks showed an increase in traffic handled in 1946. Like the railroads, those carriers experienced a decline in traffic following the end of the war, but beginning with April, 1946, an upward trend in traffic began. As more new trucks are coming off assembly lines daily, this trend may continue for some time ahead.

Financial Results of Operation

Declining railroad traffic and increasing unit operating costs in 1946 led to reduced gross and net earnings. It was the second year of decrease in gross and the fourth successive year of decreases in net.

As this article goes to press, the effect of the 17-day coal strike on railroad revenues and expenses in November and December is difficult to foresee. Further, those railroads which have not been accruing tax carry-back credits monthly will take the entire credit in December accounts. Other adjustments to be made at the end of the year will be reflected in the December reports. For these reasons, no attempt is here made to estimate the several income account items for the year 1946 as a whole. The figures shown will be for the first 10 months of 1946, with comparative figures for the corresponding periods of previous years.

The following four tables give the significant income account items for the first 10 months of the years 1946, 1945, 1944 and 1942.

Table VI—Condensed Income Account
(10 months ended October 31)

| | 1946 (mil.) | 1945 (mil.) | 1944 (mil.) | 1942 (mil.) |
|--------------------------------|----------------|----------------|----------------|----------------|
| Total operating revenues | \$6,332 | \$7,624 | \$7,899 | \$6,073 |
| Total operating expenses | 5,272 | 5,538 | 5,202 | 3,763 |
| Operating ratio —per cent... | 83.3 | 72.6 | 65.9 | 62.0 |
| Tax accruals | 483 | 1,106 | 1,587 | 1,000 |
| Net ry. operating income | 451 | 831 | 942 | 1,161 |
| Net income | 155 | 473 | 560 | 711 |

Operating revenues in the first 10 months of 1946 declined by \$1,292 million, or 16.9 per cent, under the corresponding months of 1945. They were 19.8 per cent below the war-time peak in gross in 1944, but were slightly above those of 1942, the peak year in net earnings.

Operating expenses for the same period in 1946 were 4.8 per cent less than in 1945. The decline was due wholly

to lesser charges in 1946 for amortization of defense projects. If such charges be eliminated from the accounts of the two periods, expenses in 1946 exceeded those of 1945 by 2.3 per cent and were the highest of record for any corresponding period. Increased wage rates and material prices caused the rise in expenses, in the face of declining traffic and revenues.

The operating ratio in the first 10 months of 1946 was 83.3 per cent, a figure exceeded only on two occasions since the records of the Interstate Commerce Commission have been available. Those occasions were 1919, a year of government control and operation of the railroads, and 1920, a year consisting of 2 months of government control, 6 months of government guaranty, and 4 months of private operation.

Tax accruals in the first 10 months of 1946 were \$483 million, a decline of 56.3 per cent from 1945. The decrease was due to (1) carry-back tax credits of \$85,000,000, (2) lower net earnings on which income taxes are based, and (3) a moderate decrease in state, local, and miscellaneous taxes. Payroll taxes actually increased, due in part to the increase of one quarter per cent in the tax rate, effective January 1, 1946, and in part to the higher average earnings per employee.

Net railway operating income in the first 10 months of 1946 was \$451 million, or about the same as in the corresponding period of 1939. Excluding carry-back tax credits of \$85,000,000, net railway operating income in the 1946 period was only \$366 million, or less than in the first 10 months of 1933, one of the worst years in railroad history, both from a traffic and an earning standpoint. It may be pointed out that total operating revenues in the 1946 period were more than double those of the 1933 period, yet had it not been for carry-back tax credits in the later year, net earnings would have been less than in the 1933 period.

Net income after charges in the first 10 months of 1946 was only \$155 million, of which \$85 million represented tax carry-back credits. This may be compared with a net income of \$711 million in the same months of 1942, when total operating revenues were on a slightly lower level.

Table VII shows the five principal operating revenue accounts for the first 10 months of 1946, 1945, 1944 and 1942.

**Table VII—Operating Revenues
(10 months ended October 31)**

| | 1946 (mil.) | 1945 (mil.) | 1944 (mil.) | 1942 (mil.) |
|--------------|----------------|----------------|----------------|----------------|
| Freight ... | \$4,770 | \$5,665 | \$5,857 | \$4,878 |
| Passenger .. | 1,081 | 1,410 | 1,504 | 801 |
| Mail | 104 | 106 | 104 | 89 |
| Express .. | 75 | 125 | 120 | 75 |
| All other.. | 302 | 318 | 314 | 230 |
| Total .. | \$6,332 | \$7,624 | \$7,899 | \$6,073 |

Freight revenue declined by \$895 million in the first 10 months of 1946, or 15.8 per cent below 1945. The 1946 revenue included about \$120 million due to the interim rate increases effective July 1 of that year.

Passenger revenue declined by \$329 million in the first 10 months of 1946, a decrease of 23.3 per cent below 1945. The rate of decrease grew steadily from month to month throughout the year, and the downward trend appears not yet to have run its course.

Mail revenue showed the least actual and relative decrease among the five principal revenue accounts, declining by 1.9 per cent below 1945.

Express Traffic

Railroad express revenue, on the other hand, showed the greatest relative decrease, being 40.0 per cent below 1945. The increase in express rates authorized in Ex Parte No. 163 by the Interstate Commerce Commission in its decision of October 28, 1946, may help to remedy this situation, in part at least, in 1947. The gross revenues of the Railway Express Agency, from which its own operating expenses must be met before any distribution is made to the railroads and other participating carriers, amounted to \$313,963,970 during the first nine months of 1946, compared with \$331,162,704 for the corresponding period of 1945. The decrease was 5.2 per cent.

Table VIII shows the five principal operating expense items for the first 10 months of 1946 and earlier years. The two maintenance accounts for 1945 reflect the greatly accelerated charges for amortization of defense projects in September and October.

**Table VIII—Operating Expenses
(10 months ended October 31)**

| | 1946 (mil.) | 1945 (mil.) | 1944 (mil.) | 1942 (mil.) |
|------------------------------|----------------|----------------|----------------|----------------|
| Maint. of way & struct. | \$965 | \$1,112 | \$1,049 | \$652 |
| Maint. of equipm't .. | 1,221 | 1,535 | 1,320 | 995 |
| Traffic | 137 | 118 | 112 | 97 |
| Transportation .. | 2,649 | 2,500 | 2,455 | 1,829 |
| General & other.. | 300 | 273 | 266 | 190 |
| Total | \$5,272 | \$5,538 | \$5,202 | \$3,763 |

Excluding amortization charges, maintenance of way and structures expense in the first 10 months of 1946 was the only one of the five principal operating expense accounts to show a decrease below 1945. Excluding the \$51,400,000 charged in the 1945 period for the purpose and the \$331,000 charged in the 1946 period, way and structures expense declined by \$96 million in 1946, or 9.1 per cent.

Amortization charges to maintenance of equipment accounts were \$339,900,000 in the 1945 period and \$7,700,000 in the 1946 period. Excluding the charges, maintenance of equipment expense in

1946 increased \$18,700,000 over 1945, or 1.6 per cent.

Transportation expense, the largest of the principal expense accounts, and the one that reflects the direct cost of handling and moving traffic, increased by \$149 million in the first 10 months of 1946, or 6.0 per cent over 1945. It was the highest point ever reached by that important expense account.

The final table in the income account series shows the rate of return earned on property investment, both before and after deducting accrued depreciation.

Table IX—Rate of Return on Property Investment

| Year | Net railway operating income (millions) | Rate of return—per cent | |
|----------------|---|-------------------------|----------------------------------|
| | | On total investment | On investment after depreciation |
| 1946 (10 mos.) | \$451 | *1.91 | *2.40 |
| 1945 | 852 | 3.01 | 3.77 |
| 1944 | 1,106 | 3.97 | 4.74 |
| 1943 | 1,360 | 4.92 | 5.72 |
| 1942 | 1,485 | 5.50 | 6.32 |
| 1941 | 998 | 3.75 | 4.26 |
| 1940 | 682 | 2.59 | 2.93 |
| 1939 | 589 | 2.25 | 2.55 |
| 1938 | 373 | 1.43 | 1.62 |
| 1937 | 590 | 2.27 | 2.55 |
| 1929 | 1,252 | 4.81 | 5.23 |

* Annual basis.

The rate of 1.91 per cent earned in the first 10 months of 1946 was only one-half of one percentage point above the 1938 figure. If carry-back tax credits of \$85 million taken in the 1946 period be excluded, the rate of return would be only 1.55 per cent.

Based on investment after deducting accrued depreciation, the rate of return in the first 10 months of 1946 was 2.40 per cent. This was less than the average for the five-year period 1936-1940. Excluding tax carry-back credits, the return in the 1946 period was 1.94 per cent, or about the same as in the five-year period 1931-1935, the worst in railroad history.

Railway Equipment

During the war, railroads were handicapped by failure to obtain needed new equipment, and by shortages in materials and supplies used in daily operations. While some improvement in deliveries has taken place since the end of the war, the situation is still far from satisfactory, due to strikes and other developments that have slowed down deliveries of new equipment, fuel, materials and supplies.

Table X shows railroad ownership of equipment at the end of each year, for 1946 (November 30) and the preceding five years. Installations of new equipment and the number of new units on order are also shown.

Ownership of railroad equipment declined during 1946, as retirements exceeded new installations. The ownership of steam locomotives reached its lowest point since 1900, while ownership of electric and Diesel locomotives continued the upward trend of recent years. The

Table X—Equipment Ownership and Installations

| | Ownership at end of year | Installed during year | On order at end of year |
|---|--------------------------------|--------------------------|-------------------------------|
| Steam locomotives: | | | |
| 1946 (11 months) | 37,484 | 82 | 65 |
| 1945 | 38,683 | 109 | 92 |
| 1944 | 39,451 | 329 | 66 |
| 1943 | 39,501 | 429 | 339 |
| 1942 | 39,157 | 308 | 355 |
| 1941 | 39,358 | 161 | 258 |
| Electric and Diesel locomotives: | | | |
| 1946 (11 months) | 4,135 | 398 | 499 |
| 1945 | 3,730 | 534 | 379 |
| 1944 | 3,233 | 609 | 402 |
| 1943 | 2,638 | 344 | 616 |
| 1942 | 2,307 | 404 | 533 |
| 1941 | 2,056 | 472 | 288 |
| Freight-carrying cars: | | | |
| 1946 (11 months) | 1,742,490 | 37,219 | 63,616 |
| 1945 | 1,759,662 | 38,987 | 37,160 |
| 1944 | 1,764,109 | 40,392 | 36,597 |
| 1943 | 1,750,279 | 28,708 | 35,737 |
| 1942 | 1,739,111 | 63,009 | 27,061 |
| 1941 | 1,693,978 | 80,502 | 74,897 |

number of steam locomotives owned on November 30, 1946, was 1,199 less than on December 31, 1945, while the number of electric and Diesel locomotives owned increased by 405. Diesel locomotives owned at the end of November, 1946, numbered 3,402, of which 2,561, or 75.3 per cent, were in switching service.

During the war, railroad ownership of freight cars increased by 134,000 units, from October, 1940, the low point, to August, 1944, the high point. Since that time, ownership has declined by 30,000 units to the end of November, 1946. This situation reflects the difficulty of obtaining new cars during the war period, particularly the last year of the war, and the hard usage of cars during the war years, necessitating retirements.

Installations of new freight cars in the first 11 months of 1946 numbered 37,219. For the year as a whole, installations approximated 40,000 new cars, only slightly above the annual installations of the previous three years. However, at the end of November, 1946, there were 63,616 new cars on order, or about 26,000 cars more than were on order at the end of each of the previous three years. Furthermore, the prospects of obtaining deliveries on that number of cars in 1947 are brighter than they have been since the early part of the war, assuming that strikes take a lesser toll in production than in 1946.

Freight car shortages persisted throughout 1946, reaching a maximum of 39,089 cars per day during the week ended November 2. The demand for box cars was exceptionally heavy during the year, and the bulk of the shortages occurred in that type of car. Locomotive supply was generally adequate, and stored serviceable units offered a margin of safety throughout the year.

The upward trend in unserviceable equipment which set in during 1944 was halted in the second half of 1946. The ratio of unserviceable freight cars rose from a wartime low of 2.4 per cent on January 1, 1943, to 4.9 per cent on June

1, 1946. By November 1, the ratio was down to 4.0 per cent. Similarly, the ratio of unserviceable steam locomotives rose from 4.9 per cent at the beginning of 1943 to 8.7 per cent on August 1, 1946, but was reduced to 8.4 per cent on November 1.

Material Prices

Prices paid by the railroads for fuel, material and supplies increased sharply during 1946, as shown by the index of such prices in Table XI.

Table XI—Railway Material Prices (May, 1932 = 100)

| | Material & supplies (other than fuel) | Fuel (coal & oil) | All material |
|----------------|--|----------------------|-----------------|
| December, 1939 | 130.7 | 134.3 | 131.9 |
| 1940 | 133.7 | 135.1 | 134.1 |
| 1941 | 146.4 | 148.4 | 147.0 |
| 1942 | 153.1 | 155.2 | 153.8 |
| 1943 | 159.5 | 180.5 | 166.2 |
| 1944 | 162.4 | 185.1 | 169.6 |
| 1945 | 170.0 | 195.9 | 178.2 |
| June, 1946 | 182.8 | 217.3 | 193.8 |
| November, 1946 | 192.6 | 222.2 | 202.0 |

Between December, 1945, and November, 1946, unit prices of all materials increased 13.4 per cent, the same relative increase applying both to fuel and to other materials and supplies. Over a longer period, from December, 1939, to November, 1946, the all-material price index increased 53.1 per cent; the fuel index increased 65.5 per cent; the index for material and supplies other than fuel increased 47.4 per cent.

Based on the estimated physical volume of purchases in 1946, the price increases between 1939 and 1945 added \$344 million to annual railroad operating costs, while the 1946 increases added another \$200 million.

Table XII shows gross expenditures for additions and betterments to railway property, and purchases of fuel, materials and supplies, for the ten years 1937 to 1946, inclusive.

Table XII—Capital Expenditures and Purchases

| | Gross capital expenditures (thousands) | Purchases of fuel, material and supplies (thousands) |
|-----------------|--|--|
| 1946 | \$550,000 | \$1,600,000 |
| 1945 | 562,980 | 1,572,404 |
| 1944 | 560,112 | 1,610,529 |
| 1943 | 454,282 | 1,394,281 |
| 1942 | 534,897 | 1,259,811 |
| 1941 | 543,021 | 1,161,274 |
| 1940 | 429,147 | 854,463 |
| 1939 | 262,029 | 769,314 |
| 1938 | 226,937 | 583,282 |
| 1937 | 509,793 | 966,383 |
| Total, 10 years | \$4,633,198 | \$11,771,741 |

Capital expenditures and purchases were affected in 1946 by rising price levels. By reason of that fact, both were close to the outlays for the preceding two years. Expressed in physical terms, however, both capital improvement work and purchases declined in 1946 by 10 per cent or more.

Capital expenditures in 1946 approximated \$550 million, compared with \$563

million in 1945. About 55 per cent of the 1946 expenditure was for equipment and about 45 per cent for improvements to roadway and structures.

Purchases of fuel, materials and supplies in 1946 amounted to about \$1,600 million, an increase of 2 per cent over 1945 and an increase of 46 per cent over the average of the preceding 10 years. As already pointed out, purchases in 1946 were about 10 per cent less than in 1945, when reduced to the same relative price basis.

Rail and cross tie renewals during the war period were restricted by shortages in materials and manpower. Some improvement occurred in 1946 in both situations, but quantity and quality still felt the effects of war conditions. Fuel stocks were materially affected by the two coal strike periods, being reduced in each of those periods.

Average Revenue

Revenue per ton mile averaged 0.975 cent in 1946, while revenue per passenger-mile was 1.95 cents. A number of factors affected these averages, such as the following:

1. The decline in the proportion of manufactured products handled, particularly in the early part of the year.
2. The interim increase* in freight rates of about 6 per cent, effective July 1, 1946.
3. The restricted movement of coal in 10 weeks of the year, due to strikes in the coal fields.
4. The reduced volume of furlough travel at 1¼ cents per mile, due to the reduced number of men in the armed services.

Of the foregoing factors, the first would tend to reduce average receipts per ton-mile, whereas the second and third would tend to increase them. In addition, the average length of haul was less in 1946 than in 1945, which would also tend toward an increase in average receipts. The fourth factor, applying to average receipts per passenger-mile, helped to increase that average, although passenger fare levels did not change during the year. Table XIII shows the two averages, revenue per ton-mile and per passenger-mile, for 1946 and each year back to 1939. For comparative purposes, the year 1929 is also shown.

The freight rate increases authorized

Table XIII—Revenue Per Traffic Unit

| Year | Per ton-mile (cents) | Per passenger-mile (cents) |
|------|-------------------------|----------------------------------|
| 1946 | .975 | 1.950 |
| 1945 | .959 | 1.871 |
| 1944 | .949 | 1.874 |
| 1943 | .933 | 1.882 |
| 1942 | .932 | 1.916 |
| 1941 | .935 | 1.753 |
| 1940 | .945 | 1.754 |
| 1939 | .973 | 1.839 |
| 1929 | 1.076 | 2.808 |

by the Interstate Commerce Commission in its decision in Ex Parte No. 162, effective January 1, 1947, may raise the average revenue per ton-mile to about 1.1 cents, or $2\frac{1}{4}$ per cent above the 1929 average. Revenue per passenger-mile in 1946 was more than 30 per cent below the 1929 average.

Efficiency and Economy

The next series of four tables compare significant performance averages of railroad operations in 1946 with those during the war period. Comparable figures for 1929 and 1920 are also shown, in order to indicate the trends over a longer period.

In appraising the performance averages for 1946, it should be kept in mind that traffic volume is an important factor influencing some of those averages. Other things equal, performance averages will generally show to better advantage in periods of high traffic volume than in periods of low volume. The declines in 1945 and 1946 in certain of the averages from the war-time peaks of 1944 reflect that fact.

The most significant operating average in freight service is the number of ton-miles per freight train-hour. This combines the load and speed factors, and shows the unit output per hour of freight train operation. The average is computed on two bases: (1) gross ton-miles of cars and contents per freight train-hour, and (2) net ton-miles (loading only) per freight train-hour. These averages are shown in Table XIV.

Table XIV—Ton-Miles Per Freight Train-Hour

| Year | Gross ton-miles | Net ton-miles |
|----------------|-----------------|---------------|
| 1946 (10 Mos.) | 37,101 | 17,178 |
| 1945 | 36,954 | 17,482 |
| 1944 | 37,298 | 17,623 |
| 1943 | 35,970 | 16,997 |
| 1942 | 35,503 | 16,132 |
| 1941 | 34,684 | 14,930 |
| 1940 | 33,811 | 14,028 |
| 1939 | 32,808 | 13,450 |
| 1929 | 24,539 | 10,580 |
| 1920 | 14,877 | 7,303 |

The long term advance in efficiency of freight operations is clearly indicated by these averages. Between 1920 and 1929, years of reasonable comparability in traffic volume, gross ton-miles per freight train-hour increased by 64.9 per cent and net ton-miles increased by 44.9 per cent.

Between 1929 and 1941, also years of reasonable traffic volume comparability, the average based on gross ton-miles increased 41.3 per cent, while the net ton-mile average rose 41.1 per cent. Between 1941 and 1946 (first 10 months), the respective increases were 7.0 per cent and 15.1 per cent, although these figures are of less significance possibly than the others because of the 23 per cent greater volume of traffic handled in 1946. It will be noted that the declines in the averages in 1946 from the war-time highs of 1944 were relatively small.

Another set of significant operating averages is that showing the daily mileage of locomotives and freight cars. The characteristics of war traffic, involving long hauls, lent themselves to sharp advances in the number of miles run by locomotives and cars per day. Since the close of the war, and disappearance of many of these favorable factors, the averages have tended to return to about the level of 1941. They are shown in Table XV.

Table XV—Daily Mileage of Locomotives and Cars

| Year | Freight locomotives | Passenger locomotives | Freight cars |
|----------------|---------------------|-----------------------|--------------|
| 1946 (10 mos.) | 115.7 | 223.0 | 45.1 |
| 1945 | 118.5 | 227.0 | 49.3 |
| 1944 | 122.8 | 222.9 | 51.9 |
| 1943 | 124.5 | 220.9 | 51.0 |
| 1942 | 122.4 | 206.8 | 48.8 |
| 1941 | 116.4 | 195.6 | 43.7 |
| 1940 | 107.5 | 190.8 | 38.9 |
| 1939 | 104.0 | 184.2 | 36.4 |
| 1929 | 91.2 | 164.5 | 34.4 |
| 1920 | 89.1 | 158.5 | 27.0 |

Freight locomotives averaged 2.4 per cent fewer miles in 1946 than in 1945; passenger locomotives showed a decline of 1.8 per cent; freight cars showed the greatest relative decline, 8.5 per cent, a fact which in no small measure contributed to the car shortages experienced throughout the year. As previously indicated, the decline in these averages from the war-time peaks is largely attributable to the disappearance of certain favorable factors that existed during the war. In addition to the declining length of haul in freight service, a factor which lessens the opportunity to obtain high daily mileages per locomotive and per car, widespread adoption of the 5-day week by industry has also been a deterrent. When cars are available for loading or arrive for unloading on Friday, there is now a lapse of two days (Saturday or Sunday) while industry is shut down. This extra day of car idleness cuts down on the use of cars, increases the turnaround time, and reduces all performance averages based on the number of cars.

Average train speeds were the only performance averages that declined during the war period. Also, they were the only ones that increased after the war was over. The principal reasons for the downward trend in speed averages during the war were the great increase in the number of trains operated, and the increased length and loading of trains, with resulting delay and congestion. Since the war's end, the number and loading of trains have declined, and it has been possible to increase average speeds. The averages for freight and passenger trains for 1946 and certain earlier years appear in Table XVI.

Average freight train speed in 1946 increased 2.5 per cent over 1945. Passenger-train speed also increased 2.5 per cent. Further advances to or above pre-war standards in both services are to be anticipated.

Table XVI—Average Train Speed (m. p. h.)

| Year | Freight trains | Passenger trains |
|----------------|----------------|------------------|
| 1946 (10 mos.) | 16.1 | 36.6 |
| 1945 | 15.7 | 35.7 |
| 1944 | 15.7 | 35.8 |
| 1943 | 15.4 | 35.7 |
| 1942 | 15.8 | 36.9 |
| 1941 | 16.5 | 37.6 |
| 1940 | 16.7 | 37.3 |
| 1939 | 16.7 | 36.9 |
| 1929 | 13.2 | ... |
| 1920 | 10.3 | ... |

Average car and train loads declined in 1946. The decreases were moderate in freight service and substantial in passenger service. O. D. T. Orders Nos. 1 and 18(a) requiring maximum loading of freight cars, remained in effect throughout 1946. The changing composition and volume of freight traffic were the principal causes of reduced train and car loads in that service, and the sharp reduction in volume of passenger traffic accounted for the lighter average loads in that service. As stated earlier in connection with Table III, aggregate car-loadings of l. c. l. freight, which average around 10 tons per car, increased in 1946, while aggregate loadings of car-load traffic, which average about 40 tons per car, decreased. The effect of these two trends would be to reduce average load per freight car.

Table XVII shows average loads per car and per train in freight and passenger services.

Table XVII—Average Train and Car Loads

| Year | Freight service Net tons per train | Net tons per car | Passenger service Passengers per train | Passengers per car |
|----------------|--|---------------------|--|-----------------------|
| 1946 (10 mos.) | 1,084 | 31.3 | *150.6 | *25.4 |
| 1945 | 1,129 | 32.2 | 190.5 | 30.2 |
| 1944 | 1,139 | 32.7 | 200.7 | 31.9 |
| 1943 | 1,116 | 33.3 | 189.5 | 31.1 |
| 1942 | 1,035 | 31.8 | 125.5 | 23.1 |
| 1941 | 915 | 28.5 | 73.2 | 15.8 |
| 1940 | 849 | 27.6 | 60.7 | 13.8 |
| 1939 | 813 | 26.9 | 58.0 | 13.4 |
| 1929 | 804 | 26.9 | 55.0 | 11.7 |
| 1920 | 708 | 29.3 | 82.5 | 20.6 |

* Nine months.

The decreases in average loads in the first 10 months of 1946 compared with the year 1945 were as follows: net tons per train, 45 tons, or 4.0 per cent; net tons per car, 0.9 ton, or 2.8 per cent; passengers per train, 39.9 passengers, or 20.9 per cent; passengers per car, 4.8 passengers, or 15.9 per cent.

Railroad Safety

Both the number of accidents and the casualties to persons resulting therefrom were reduced in 1946. In the first 10 months of the year, the number of train accidents declined 9.1 per cent, the number of passenger fatalities declined 30.4 per cent, and the number of employee fatalities decreased 23.5 per cent. There was a small increase in highway grade crossing casualties, due to the increasing use of automobiles. Fatalities in such ac-

Speed

| | |
|---------------------|--|
| Passenger trains | |
| 36.6 | |
| 35.7 | |
| 35.8 | |
| 35.7 | |
| 36.9 | |
| 37.6 | |
| 37.3 | |
| 36.9 | |
| ... | |
| ... | |

declined moderate in pas- s Nos. 1 loading n effect r compo- ffic were rain and he sharp er traffic ge loads r in con- cate car- ch aver- eased in of car- 40 tons of these average

oads per assenger and Car service passengers per car

| |
|-------|
| *25.4 |
| 30.2 |
| 31.9 |
| 31.1 |
| 23.1 |
| 15.8 |
| 13.8 |
| 13.4 |
| 11.7 |
| 20.6 |

s in the ed with et tons nt; net r cent; rers, or ar, 4.8

nd the efrom rst 10 f train e num- d 30.4 ployee There grade easing ch ac-

4, 1947.

cidents increased by one during the first 10 months of 1946, while nonfatal injuries increased by 97. Trespasser casualties showed a slight decrease.

The Outlook

Looking back, 1946 was a year of great opportunities for rapid advance in readjustment to peacetime activities. Some of those opportunities were realized; many others were not, because of persistent, prolonged, and unnecessary work stoppages. The national economy felt deeply the effects of these labor disturbances, as a result of the time loss of more than 100 million man-days, consequent loss in production, and the infinite number of unbalances between demand and supply of producer and consumer goods thus created.

The situation has not been different in its broad outlines from that following the first World-war, although the details are not the same. For a period of two years after the end of that war, the economy maintained a feverish but unbalanced pace. The pace slowed down sharply in the third year, until order and balances were restored. One characteristic of that particular post-war period, although unfortunately it did not characterize late 1945 and early 1946, was that the government did not presume to interfere with the normal process of transition from a wartime to a peacetime economy. The transition of 1919 to 1922 brought its difficulties, but they were soon surmounted, both as to production and price deflation. The rich promises of the post-war era were then fulfilled, and an extended period of prosperity ensued.

It is by no means certain that the economy must now go through the wringer, so to speak, before it again attains normal peacetime levels. Existing weaknesses in the economic machinery can be remedied without slowing the wheels of industry, if the American people are of a mind to do it. Patience, foresight and, above all, a firm hand will see the nation safely through the rest of the transition period. Recognition of this fact was growing as the year 1946 ended, and gave promise that appropriate restraints would be imposed on those pushing their ill-conceived and selfish advantages.

The railroads, caught with other industries in the tide of rising unit operating costs, look to 1947 with the hope that the upward trend in that respect will be halted, and perhaps reversed. Traffic prospects for the year are good, with greater net earnings in sight than those of 1946. Further increases in operating costs, however, could offset the improvement now anticipated. If both the railroad and other industries are forced to meet further cost rises, such a development would bring us closer to that post-war recession which some observers are

even now predicting. With costs under control, on the other hand, a substantial volume of freight traffic, handled at the higher rates in effect as from January 1, would go far toward stabilizing the railroad industry itself, and the many other industries from which the railroads buy and to which they render indispensable transportation service.

A Year of Labor Turmoil

(Continued from page 11)

the state legislatures to take care of the remaining details (including seats in cabooses and the density of smoke in stations), the unions will continue to use their political powers to gain increased benefits through "hidden wage" devices. As one railroad personnel officer has put it, the organizations have increased their political power until it is scarcely less than their bargaining power.

Fetishes in Labor

Basic fetishes abound in labor doctrine in general, which management may expect to hear from railroad labor in the future. If prices rise, the unions will doubtless tie a higher hourly wage rate to the cost-of-living kite. If employment declines, they will instead tie higher "take-home," or weekly, pay to that kite. Further, management may be faced with demands based on average budgets for so-called "decent" living. (Since the labor executives' report dubs the pay of airplane pilots—\$7,000 to \$9,000 for a limited number of hours—as just "decent," the amplitude of this adjective may be appreciated.) If the railroads are prosperous, labor may try the "ability-to-pay" theory. If they are not, the unions will trot out its opposite—the "equal-pay-for-equal-work" principle. If the traffic load goes up, or the number of locomotives in service goes down, the "increased productivity of labor" notion will be placed on the table. And, finally, should there be some resistance to prices by retail buyers or a great increase in production, there may be heard again in negotiation halls the New Deal dictum of "increased purchasing power" necessary to keep the factories humming. Whatever the "angle," it will mean "boost the pay."

Even if union leaders be quiescent during 1947—which is unlikely—the increased burdens on the railroads' expense accounts next year, compared with 1939, the last real peace-time year, resulting from increased pay and benefits will amount to about \$1,655,240,000, according to an estimate by the Bureau of Railway Economics. This added expense

consists of annual increases as follows.

| | |
|---|-----------------|
| Wage rates increased | |
| 51 per cent | \$1,404,000,000 |
| Existing payroll taxes on this amount (6.5 per cent) | 84,240,000 |
| Increase in payroll taxes under Crosser Act, effective Jan. 1 (2.75 per cent) | 90,000,000 |
| Vacations granted in 1942 and 1944 | 77,000,000 |

When the increased cost of material and supplies—\$521,000,000—is added, the total increased outlay which the roads face in 1947 is brought to \$2,176,240,000. Nearly one-half of this total, or slightly more than \$1 billion, represents boosts in costs which the industry has experienced since January 1, 1946.

Box, Hopper and Reefer Supply Inadequate

(Continued from page 27)

president of the Burlington Lines, has recently proposed a plan calling for agreement by the railroads to have new freight cars built to lightweight standards, probably to produce a semi-lightweight car, and then charge a per diem of \$2 a day, a differential of 85 cents a day, for the use of the new cars of one railroad by another.

Stalemate Remains

More than once this inability of the owner to enjoy the full fruit of any increment of investment over and above that required to provide the cheapest car available has established a stalemate which has seriously retarded progress in freight-car development. A plan such as Mr. Budd proposes would tend to accelerate all such developments. It would, however, scarcely clear the way for the full exploitation of the weight reducing possibilities of the new materials. That awaits relief from present braking limitations. With the large market for new freight cars likely to break during 1947 it would be most propitious to have both limitations removed.

To preserve our voluntary, free society, we must demonstrate that it can serve all interests of the nation even better than it has in the past. If we are content merely to preen ourselves over our wartime accomplishments we will fail. Let's devote just as much brain power to expanding the demonstrated advantages of private enterprise, as we have, over the years, to the technological improvements in our own stores and factories. I, for one, would not object to borrowing a technique or two for the promotion of ideas which have been developed by someone else.

—President W. K. Jackson, U. S. Chamber of Commerce.

Railroad Equities Are Still Depressed

Bonds of solvent carriers and equipment issues continue strong, but earnings remain the only practicable source of funds for necessary improvements to fixed plant

IT CANNOT be reported for 1946 that any noticeable headway was made in dealing conclusively with the central railroad problem—that is, assuring the industry of a dependable and continuous supply of new capital so that, over the years, the traveling and shipping public may expect and receive the same degree of adequacy and modernity in railroad service that they do from those industries which are not subjected to the competition of government-owned facilities, and whose prices are not government-fixed.

In an article earlier in this issue, the *immediate* financial strength of the railroads—arising from their retention of war-time earnings in the form of ready cash or its equivalent—was pointed out. For the next few years, if current earnings are sufficient to meet ordinary expenses, plus the limited returns to which security-holders have become accustomed, the railroads should still be able to maintain expenditures for improvements and rehabilitation at a level enough higher than that supported by current earnings to enable them to catch up on some of the improvements needed for the modernization of their service,

Tables in this article were prepared by Edith Stone, *Railway Age's* librarian, and by Marion Odumirok.

By J. G. LYNE
Assistant to Editor

which they were unable to carry out during the war for lack of materials, and during the depression of the 'thirties for lack of funds.

Fair Return Only in Wartime

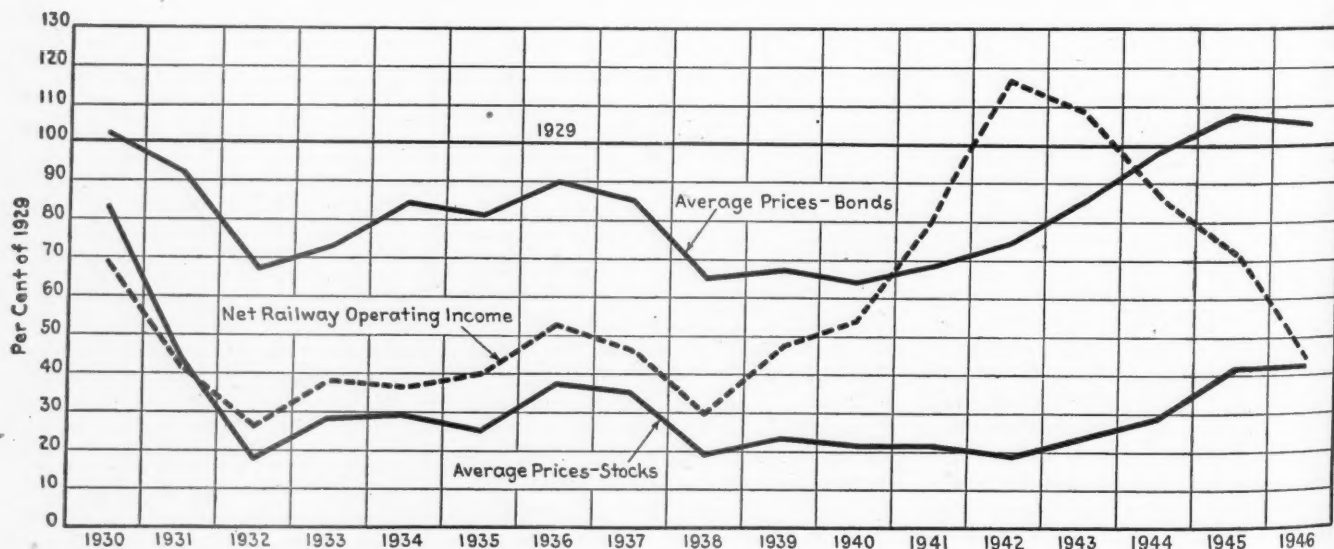
But no industry can regard its problem of capital supply as solved when it has to depend upon such seldom-recurring, unpredictable, and pathological events as world-wide war in order to provide it with the sustenance in the way of new plant which it needs, year by year, for successful normal functioning. It is like an individual who has no steady income sufficient to live on, but who has managed thus far to survive because, at a moment of acute financial distress, a relative passed away and left him a modest bequest. As long as this legacy holds out, the legatee is in no danger of immediate starvation, but it can scarcely be asserted of him that the problem of his economic well-being has been permanently disposed of.

The "factors of production" of any commodity or service comprise "land,

labor, and capital," in the classic phrase, plus the "entrepreneur" or manager. Production arises from bringing these factors together and putting them to work. Those who own or control any one of the factors, naturally, want to be compensated with the largest share of the total product that they can persuade the owners of the other factors to yield to them.

On the railroads, for many years, political pressure has directed primary attention toward increasing the share of the product going to labor—while also holding down the total amount to be shared by strictly limiting the prices which the industry is permitted to charge for its product; and by providing competing services, supported partially at taxpayers' expense, which divert business from the railroads when they make the effort to collect all the cost of their service, including an attractive return to investors, from their customers.

The same political pressure to increase the compensation of labor exists in other industry, and not alone on the railroads—but, in other industry, exactions of labor are quickly passed on to the consuming public in the form of increased prices, so the actual share of the total product going to "capital" suffers no inevitable decrease. For these



Railway Age Average Prices of 20 Representative Stocks and 20 Bonds

Stock prices are not determined by current earnings but by the market's estimate of what the future holds

other industries, moreover, there are no competing government services supported partly or entirely by taxes on non-users (as highways, waterways, and airports are supported) which take away these industries' customers if they try to recoup their increased costs by higher selling prices.

Railroads Still Have an O. P. A.

There is, in other words, a nether millstone of labor demands operating in all industry—but only the railroads (and, to a lesser degree, other “regulated” industries) have also upon them an upper millstone in the form of government price-fixing and government competition. As long as O. P. A. existed, to be sure, other industry also was in the same fix as the railroads (except that Uncle Sam does not engage in direct competition in other industry as he does in transportation)—but other industry, thanks largely to the leadership of the National Association of Manufacturers, decided it did not relish being in such a mill and persuaded the public to turn it loose.

Capital, in short, when it goes to work for the railroads, has, on the average, been assured of sub-standard “wages,” sub-standard “working conditions,” and sub-standard “security”—as compared to capital which gets a job in those indus-

New Issues of Railroad Securities Offered for Sale in the United States† 1934-1946

| (Amounts in thousands of dollars) | | | | | |
|-----------------------------------|-----------|---------|----------------|----------------------|-------------------------------|
| Year | Bonds | Stock | Railroad total | Total all industries | Railroad as per cent of total |
| 1934 | \$176,423 | ..... | \$176,423 | \$397,240 | 44.4 |
| 1935 | 126,031 | ..... | 126,031 | 2,331,630 | 5.4 |
| 1936 | 793,618 | \$3,838 | 797,456 | 4,571,670 | 17.4 |
| 1937 | 344,257 | ..... | 344,257 | 2,309,524 | 14.9 |
| 1938 | 54,873 | ..... | 54,873 | 2,154,664 | 2.5 |
| 1939 | 185,474 | 233 | 185,707 | 2,164,007 | 8.6 |
| 1940 | 323,912 | ..... | 323,912 | 2,677,173 | 12.1 |
| 1941 | 366,313 | ..... | 366,313 | 2,666,887 | 13.7 |
| 1942 | 47,726 | ..... | 47,726 | 1,062,288 | 4.5 |
| 1943 | 161,179 | ..... | 161,179 | 1,169,692 | 13.8 |
| 1944 | 609,010 | 350 | 609,360 | 3,201,891 | 19.0 |
| 1945 | 1,453,517 | 504 | 1,454,021 | 6,010,985 | 24.2 |
| 1946* | 634,848 | ..... | 634,848 | 4,915,209 | 12.9 |

* 10 months total.

† Compiled by Securities and Exchange Commission.

tries which have only a nether millstone working upon them, and not one atop them too. Under such conditions of low average “wages” for capital as a whole in the railroad industry, the problem of getting enough capital to keep the industry going has been partially solved by two expedients, viz., (1) setting up a favored class of capital (e. g., equipment trust certificates and first mortgage bonds) which is paid the going market “wage,” at the expense of even less earnings and less security for that part of railroad capital not so favored; and (2) using “slave capital” (e. g., earnings which justly belong to the owners as dividends, but which the owners themselves may permit

to be retained in the business for improvements, needed in the interest of adequate service, but for which no “voluntary” new capital would ever seek employment).

Other Industry Fares Better

Equity capital invested in “industrials,” at its highest 1923 price on the Dow-Jones average was only 17 per cent above the Dow-Jones average for railroad equities. By 1929, “industrials” had climbed up to a preference of 100 per cent above railroad stocks. During the thirties the relative position of railroad stocks slipped still further, until, in 1940, “industrials” topped the railroad average

Representative Equipment Note Issues in 1946

| Road | Amount | Max. Term, Years | % of Equipment Cost Covered | Interest Cost, % | Sold to |
|---|------------|------------------|-----------------------------|------------------|---|
| Atchison, Topeka & Santa Fe..... | \$ 927,800 | .. | 80 | 1.6475 | Central Hanover Bank & Trust Co., New York |
| Baltimore & Ohio, Ser. J..... | 2,352,000 | .. | 80 | 1.495 | First National Bank, Kansas City, Mo. |
| Bangor & Aroostook..... | 2,024,000 | .. | 80 | 1.5 | Northern Trust Co., Chicago |
| Chicago, Burlington & Quincy..... | 269,935 | 10 | 100 | 2.75 | Wachovia Bank & Trust Co., Winston-Salem |
| Chicago, Indianapolis & Louisville..... | 1,200,000 | 7 | 86 | 1.5 | Irving Trust Co. |
| Erie..... | 332,000 | 5 | 80 | 1.72 | Worcester County Trust Co., Mass. |
| Florida East Coast..... | 1,998,831 | 10 | 80 | 1.5 | Northern Trust Co.-Manufacturers & Traders Trust Co., Buffalo |
| Fort Worth & Denver City..... | 3,969,090 | 10 | 75 | 1.94 | First National Bank, Chicago |
| Live Oak, Perry & Gulf..... | 1,890,000 | 10 | .. | 1.5 | Chase National Bank |
| Missouri-Kansas-Texas..... | 979,050 | 10 | 80 | 1.67 | Manufacturers & Traders Trust Co., Buffalo |
| Montour..... | 254,800 | 10 | 80 | 1.64 | National Commercial Bank & Trust Co., Albany |
| Union Freight..... | 1,272,156 | 6 | 75 | 1.35 | Florida National Bank, Jacksonville |
| | 71,860 | 8 | 90 | 1.375 | Republic National Bank, Dallas |
| | 1,382,255 | .. | 66 | 2.75 | Atlantic National Bank, Jacksonville |
| | 400,000 | 4 | .. | 1.92 | Manufacturers & Traders Trust Co., Buffalo |
| | 170,000 | 7 | .. | 1.5 | Union Trust Co., Pittsburgh |
| | | | | 2 | New England Trust Co. |

Representative Equipment Trust Issues Sold in 1946

| Road | Maturity | Amount | Int. Rate % | Sold to Banker | | Purchaser |
|---|-----------|-------------|-------------|----------------|-------|---|
| | | | | Price | Cost | |
| Baltimore & Ohio, Ser. Q..... | 1947-1956 | \$4,060,000 | 1½ | 99.011 | 1.70 | Philadelphia National Bank, et al. |
| Baltimore & Ohio, Ser. R..... | 1947-1956 | 7,620,000 | 1½ | 99.29 | 2.02 | Salomon Bros. & Hutzler, et al. |
| Central of Georgia, Ser. U..... | 1947-1956 | 2,300,000 | 2½ | 99.87 | 2.15 | Fulton National Bank of Atlanta, et al. |
| Chesapeake & Ohio..... | 1947-1956 | 1,750,000 | 1½ | 99.612 | 1.198 | Halsey, Stuart & Co. |
| | 1947-1956 | 1,500,000 | 1½ | 99.74 | 1.42 | Central Hanover Bank & Trust Co. |
| | 1947-1956 | 1,750,000 | 1½ | 99.517 | 1.59 | Halsey, Stuart & Co., et al. |
| | 1947-1956 | 1,500,000 | 1½ | 100.071 | 1.74 | Halsey, Stuart & Co., et al. |
| Chicago & North Western..... | 1947-1961 | 6,870,000 | 1½ | 100.5673 | 1.55 | Halsey, Stuart & Co., et al. |
| | 1947-1956 | 10,140,000 | 2 | 100.30 | 1.94 | First Boston Corp.-Harris, Hall & Co., et al. |
| Chicago, St. P., Minn. & Omaha..... | 1947-1956 | 950,000 | 1½ | 100.159 | 1.34 | Halsey, Stuart & Co. |
| Delaware, Lackawanna & Western, Ser. D..... | 1947-1956 | 4,250,000 | 2 | par | .. | First Nat'l Bank of City of N. Y., et al. |
| Delaware, Lackawanna & Western, Ser. E..... | 1947-1956 | 4,000,000 | 2½ | 99.435 | 2.23 | Halsey, Stuart & Co. |
| Gulf, Mobile & Ohio, Ser. A..... | 1947-1961 | 2,000,000 | 2 | 100.557 | 1.92 | Salomon Bros. & Hutzler-Stroud & Co. |
| | 1947-1961 | 3,000,000 | 2½ | 100.73 | 2.03 | Salomon Bros. & Hutzler-Stroud & Co. |
| | 1947-1958 | 2,400,000 | 2 | 99.788 | 2.03 | Mercantile Com. Bk. & Tr. Co. of St. Louis |
| | 1948-1959 | 3,600,000 | 2 | 99.2599 | 2.13 | Halsey, Stuart & Co., et al. |
| New York, Chicago & St. Louis..... | 1947-1956 | 1,780,000 | 1½ | 99.41 | 1.61 | Harris, Hall & Co., et al. |
| New York, Ontario & Western..... | 1947-1956 | 2,600,000 | 3 | Par | .. | R. F. C. |
| Northern Pacific..... | 1947-1956 | 6,880,000 | 1½ | 98.718 | 2.01 | Halsey, Stuart & Co. |
| Pennsylvania, Ser. Q..... | 1947-1960 | 7,322,000 | 1½ | 100.528 | 1.8 | Salomon Bros. & Hutzler, et al. |
| Pere Marquette..... | 1947-1956 | 1,300,000 | 1½ | 100.025 | 1.50 | Union Bank & Commerce Co.-First National Bank, Cincinnati |
| | 1947-1956 | 850,000 | 1½ | 99.636 | 1.57 | Savings Bank of Baltimore |
| St. Louis-San Francisco..... | 1947-1956 | 5,500,000 | 1½ | 99.93 | 1.89 | Salomon Bros. & Hutzler-Stroud & Co. |
| Southern, Ser. LL..... | 1947-1956 | 7,880,000 | 1½ | 99.611 | 1.69 | First Nat'l Bk., N. Y., et al. |
| | 1947-1956 | 7,600,000 | 1½ | 99.04 | 1.95 | Blair & Co. |
| Union..... | 1947-1956 | 1,500,000 | 1½ | 98.333 | 1.57 | Halsey, Stuart & Co. |
| Western Maryland, Ser. J..... | 1947-1956 | 2,000,000 | 1½ | 99.051 | 1.69 | Halsey, Stuart & Co. |
| | 1947-1956 | 2,740,000 | 1½ | 99.279 | 1.89 | Halsey, Stuart & Co. |
| Wheeling & Lake Erie, Ser. L..... | 1947-1956 | 1,720,000 | 1½ | 99.066 | 1.69 | Halsey, Stuart & Co., et al. |

by 375 per cent. During the war, the relative position of railroad shares to that of industrials improved, not because of any marked betterment in their intrinsic position, but because other industry, under war conditions, was to some degree subject temporarily to restraints of the kind under which the railroads suffer chronically.

By 1945, the relative position of the "industrials" had slipped sufficiently so

that their average price was only 200 per cent above that of railroad shares. As O. P. A. and other government regulation of industry which is normally unregulated began to be removed in 1946, the relative price of "industrials" as compared to railroad stocks began once more to mount, and toward the end of December had risen to an advantage of 243 per cent.

The accompanying chart, showing the

fluctuations which have occurred in net railway operating income and in the prices of railroad securities since 1929—in terms of the 1929 average taken as 100—indicates that security prices do not vary in direct relationship to earnings. They are influenced, rather, by the general state of the securities market as a whole, and by the market estimate of prospective net earnings available to security-holders. For example, the aver-

Railroads in the Hands of Receivers or Trustees on December 31, 1946

| Road | Mileage operated | Mileage owned | Date of receivership or trusteeship | Long term debt in hands of public | Capital stock in hands of public | Total securities in hands of public | Receiver's or trustee's certificates in hands of public | Principal amount of obligations in default as to principal and/or interest |
|--|------------------|---------------|-------------------------------------|-----------------------------------|----------------------------------|-------------------------------------|---|--|
| Alton..... | 959 | 693 | Nov. 25, 1942 | \$53,508,846 | None | \$53,508,846 | None | \$45,350,000 |
| Kansas City, St. Louis & Chicago..... | ..... | 157 | Apr. 30, 1943 | None | \$1,864,200 | \$1,864,200 | None | None |
| Louisiana & Missouri River..... | ..... | 76 | Feb. 17, 1944 | None | \$344,300 | \$344,300 | None | None |
| Central of Georgia..... | 1,816 | 1,405 | Dec. 19, 1932(a) | 51,399,467 | None | 55,138,049 | 3,099,589 | 51,399,467 |
| Central Railroad of New Jersey..... | 649(b) | 376 | Oct. 31, 1939 | 49,091,051 | 11,652,800 | 60,743,851 | None | 48,731,000 |
| Chicago, Rock Island & Pacific..... | 7,651 | 4,916 | June 7, 1933 | 255,047,600 | 128,892,512 | 383,940,112 | 12,011,988 | 161,238,600 |
| Chicago, Rock Island & Gulf..... | ..... | 635 | Oct. 31, 1933 | None | None | None | None | None |
| Choctaw, Oklahoma & Gulf..... | ..... | 785 | Oct. 31, 1933 | 8,170,000 | None | 8,170,000 | None | 4,000 |
| Peoria Terminal..... | 29(c) | 27(c) | Oct. 31, 1933 | 4,000 | None | 4,000 | None | 4,000 |
| Rock Island, Arkansas & Louisiana..... | ..... | 376 | Aug. 31, 1933 | 11,453,600 | None | 11,453,600 | None | 11,453,600 |
| Rock Island, Memphis Terminal..... | ..... | 6(c) | Oct. 31, 1933 | None | None | None | None | None |
| Rock Island, Omaha Terminal..... | ..... | 3(c) | Oct. 31, 1933 | None | None | None | None | None |
| Rock Island, Stuttgart & Southern..... | ..... | 21 | Oct. 31, 1933 | None | None | None | None | None |
| St. Paul & Kansas City Short Line..... | ..... | 417 | Aug. 31, 1933 | 18,427,310 | None | 18,427,310 | None | 18,427,310 |
| Denver & Rio Grande Western..... | 2,386 | 2,089 | Nov. 1, 1935 | 126,187,000 | 16,433,200 | 146,105,200 | None | 120,216,000 |
| Denver & Salt Lake Western..... | ..... | 38 | Nov. 1, 1935 | None | None | 3,110,850 | None | None |
| Duluth, South Shore & Atlantic..... | 530 | 426 | Jan. 2, 1937 | 3,816,000 | 10,800,000 | 14,616,000 | None | 3,816,000 |
| Mineral Range..... | 24 | 24 | June 1, 1937 | 2,800 | 705,800 | 708,600 | None | 2,800 |
| Florida East Coast..... | 682 | 676 | Sept. 1, 1931(d) | 56,130,177 | 37,500,000 | 93,630,177 | None | 45,000,000 |
| Georgia & Florida..... | 408 | 363 | Oct. 19, 1929 | 8,253,919 | 13,382,441 | 21,991,081 | 600,000 | 8,253,919 |
| Georgia, Florida & Alabama..... | ..... | 132 | Nov. 7, 1931(e) | 175,000 | 1,500,000 | 1,675,000 | None | 175,000 |
| Hoboken Manufacturers..... | 9 | 2 | July 26, 1943 | 100,427 | 400,000 | 500,427 | None | 100,427 |
| Meridian & Bigbee River..... | 50 | 50 | June 15, 1933 | 500,000 | 300,000 | 812,725 | 1,188,655 | 500,000 |
| Middletown & Unionville..... | 14 | 14 | Aug. 17, 1943 | 350,500 | 150,000 | 500,500 | None | 350,500 |
| Missouri Pacific..... | 7,064 | 6,541 | Apr. 1, 1933 | 344,608,000 | 154,639,600 | 499,247,600 | None | 335,571,000 |
| Boonville, St. Louis & Southern..... | ..... | 0.18 | June 1, 1936 | 23,500 | None | 23,500 | None | 23,500 |
| Cairo & Thebes..... | ..... | 25 | Dec. 1, 1937 | 1,699,000 | None | 1,699,000 | None | 1,699,000 |
| Chester & Mount Vernon..... | ..... | 64 | Dec. 1, 1937 | None | None | None | None | None |
| Fort Smith Suburban..... | ..... | 7 | Dec. 1, 1937 | None | None | None | None | None |
| Marion & Eastern..... | ..... | 3 | Dec. 1, 1937 | None | None | None | None | None |
| Missouri Pacific R.R. Corp. in Nebr..... | ..... | ..... | May 1, 1933 | None | None | None | None | None |
| Natchez & Southern..... | 9 | 8 | Dec. 1, 1937 | None | None | None | None | None |
| New Orleans, Texas & Mexico..... | 191 | 173 | Apr. 1, 1933 | 42,970,000 | 859,800 | 43,829,800 | None | 42,970,000 |
| Asherton & Gulf..... | 32 | 32 | Dec. 1, 1937 | None | None | None | None | None |
| Asphalt Belt..... | 18 | 18 | Dec. 1, 1937 | None | None | None | None | None |
| Beaumont, Sour Lake & Western..... | 146 | 84 | May 1, 1933 | None | None | None | None | None |
| Houston North Shore..... | ..... | 27 | May 1, 1933 | None | None | None | None | None |
| Houston & Brazos Valley..... | 37 | 37 | Dec. 1, 1937 | None | None | None | None | None |
| International-Great Northern..... | 1,110 | 1,056 | Apr. 1, 1933 | 44,927,700 | None | 44,927,700 | None | 44,927,700 |
| Austin Dam & Suburban..... | ..... | 2(f) | Dec. 1, 1937 | None | None | None | None | None |
| New Iberia & Northern..... | 104 | 65 | Dec. 1, 1937 | None | None | None | None | None |
| Iberia, St. Mary & Eastern..... | ..... | 40 | Dec. 1, 1937 | None | None | None | None | None |
| Orange & Northwestern..... | 62 | 62 | Dec. 1, 1937 | None | None | None | None | None |
| Rio Grande City..... | 18 | 18 | Dec. 1, 1937 | None | None | None | None | None |
| St. Louis, Brownsville & Mexico..... | 606 | 560 | May 1, 1933 | None | None | None | None | None |
| San Antonio Southern..... | 45 | 29 | Dec. 1, 1937 | None | None | None | None | None |
| San Antonio, Uvalde & Gulf..... | 317 | 314 | May 1, 1933 | None | None | None | None | None |
| San Benito & Rio Grande Valley..... | 116 | 116 | Dec. 1, 1937 | None | None | None | None | None |
| Sugar Land..... | 42 | 19 | Dec. 1, 1937 | None | None | None | None | None |
| Murfreesboro-Nashville..... | 15 | 15 | Sept. 5, 1942 | 25,000 | None | 25,000 | None | None |
| New Jersey & New York..... | 39 | 29 | June 30, 1938 | 1,022,960 | 366,400 | 1,389,360 | None | 1,022,960 |
| New York, New Haven & Hartford..... | 1,838 | 1,158 | Oct. 23, 1935 | 247,489,101 | 206,155,300 | 455,295,637 | None | 192,913,125 |
| Hartford & Connecticut Western..... | ..... | 19 | July 31, 1936 | None | 338,200 | 338,200 | None | None |
| Old Colony..... | ..... | 448 | June 2, 1936 | 16,448,000 | 12,500,800 | 28,948,800 | None | 16,448,000 |
| Boston & Providence..... | ..... | 61 | Aug. 5, 1938 | 2,170,000 | 3,668,800 | 5,838,800 | None | 2,170,000 |
| Providence, Warren & Bristol..... | ..... | 13 | Feb. 13, 1937 | None | 44,900 | 44,900 | None | None |
| New York, Ontario & Western..... | 547 | 340 | May 20, 1937 | 34,538,861 | 58,114,043 | 92,652,904 | 480,501 | 32,992,204 |
| New York, Susquehanna & Western..... | 120 | 120 | June 1, 1937 | 13,065,430 | None | 13,065,430 | None | 12,345,608 |
| Pittsburg, Shawmut & Northern..... | 122(g) | 156 | Aug. 1, 1905(h) | 14,655,600 | 15,000,000 | 29,655,600 | 2,044,350 | 14,655,600 |
| Rio Grande Southern..... | 172 | 172 | Dec. 16, 1929 | 2,728,000 | 930,300 | 3,658,300 | 25,700 | 2,728,000 |
| Rutland..... | 407 | 393 | May 5, 1938(i) | 9,216,000 | 9,080,300 | 18,296,300 | None | 9,216,000 |
| St. Louis-San Francisco..... | 4,925 | 4,855 | Nov. 1, 1932(j) | 259,646,464 | 114,701,526 | 379,484,854 | None | 258,374,464 |
| St. Louis Southwestern & Affiliated Cos..... | 1,607 | 1,407 | Dec. 12, 1935 | 43,606,895 | 4,733,500 | 70,722,645 | None | 20,564,395 |
| Tallulah Falls..... | 57 | 57 | June 25, 1923 | None | None | None | None | None |
| Waco, Beaumont, Trinity & Sabine..... | 41 | 41 | Feb. 8, 1930 | None | 1,113,000 | 1,113,000 | 12,734 | None |
| Wisconsin Central..... | 1,051 | 906 | Dec. 2, 1932(k) | 35,594,958 | 17,032,700 | 52,627,658 | None | 35,103,958 |
| Yreka Western..... | 8 | 8 | Sept. 16, 1935 | None | 7,500 | 7,500 | 21,500 | None |

(a) Changed to trusteeship June 19, 1940.

(b) Including 230 miles operated by Central Railroad Company of Pennsylvania.

(c) Yard tracks and sidings.

(d) Changed to trusteeship April 21, 1941.

(e) Changed to trusteeship July 12, 1944.

(f) Yard switching tracks.

(g) An additional 68 miles owned and leased has been under embargo and not operated since May 18, 1946.

(h) Changed to trusteeship October 19, 1946.

(i) Changed to trusteeship July 21, 1944.

(j) Changed to trusteeship May 16, 1933.

(k) Changed to trusteeship October 1, 1944.

Note:—The effort has been made, in the above table, to list only those securities of bankrupt carriers which are actually in the hands of the investing public—and to exclude securities of one carrier held by an affiliated carrier. Where securities are held by other railways not affiliated with the issuing company, however, they are included in the above list as publicly held. Owing to the complexities of some corporate structures, the decision as to the fact of public or other-carrier ownership has, in some instances, been arbitrary. The purpose has been to give a general picture of the public stake in bankrupt carriers rather than a comprehensive tabulation of legal obligations..

red in net
and in the
nce 1929—
e taken as
prices do
p to earn
rather, by
ies market
t estimate
available to
, the aver-

Principal
amount of
obligations
in default
as to
principal
and/or
interest
\$45,350,000
None
None
51,399,467
48,731,000
61,238,600
None
4,000
11,453,600
None
None
None
18,427,310
20,216,000
None
3,816,000
2,800
45,000,000
8,253,919
175,000
100,427
500,000
350,500
35,571,000
23,500
1,699,000
None
None
None
None
None
42,970,000
None
None
None
None
44,927,700
None
None
None
None
None
None
None
1,022,960
2,913,125
None
16,448,000
2,170,000
None
32,992,204
12,345,608
14,655,600
2,728,000
9,216,000
38,374,464
10,564,395
None
None
15,103,958
None

public—
however,
er-carrier
er than a

y 4, 1947

age price of railroad stocks was practically as high in 1946 as in 1945, despite a severe decline in net operating income in 1946—the obvious reason for the failure of stock prices to reflect the 1946 earnings decline being the general belief that the railways would be given rate relief to offset, at least in substantial part, the increased operating costs which occasioned the reduction in net earnings. For a number of years, during the Great Depression of the 'thirties, many superficial observers contended that all the railroads needed to restore their

Railroads Taken from Receivership or Trusteeship During 1946

| Name of Road | Mileage operated |
|--------------------------------------|------------------|
| Catonsville Short Line..... | * |
| Chicago, Indianapolis & Louisville.. | 541 |
| St. Johnsbury & Lake Champlain... | 96 |
| Seaboard Air Line..... | 4,149 |
| Seaboard-All Florida..... | ... |
| East & West Coast..... | ... |
| Florida Western & Northern... | ... |
| Virginia & Truckee..... | 46 |
| Total..... | 4,832 |

* Removed from receivership in 1945.

credit was a trip "through the wringer," to wipe out that part of their capitalization representing plant which, it was over-hastily assumed, had been rendered surplus by the diversion to other forms of transportation of considerable traffic which had formerly moved by rail. The events of the past five years have completely discredited the "wringer" theory—in the first place, by demonstrating that the railroads do not suffer from an excess of plant in relation to the demands of traffic, but rather from a plant shortage; and, secondly, by the fact that the railroad industry has been "through the wringer," without any noticeable increase in the eagerness of investors of "venture capital" to commit their funds for the industry's expansion. War-time experience proved that the nation needs a railroad plant which will move three times as much passenger traffic and two-thirds more freight traffic than were transported in 1929—and, indeed, that the nation would be in great military peril with a smaller investment in railroad properly than it has. No "wringer" was needed, therefore, to "write off" surplus plant, since none existed. The "Monthly Comment" of the Bureau of Transport Economics & Statistics of the Interstate Commerce Commission, issued on December 11, 1946, presented a tabulation of securities of all line-haul railways in the hands of the public (i. e., excluding securities held by other railroads), from 1930 until the end of 1945. From 1930 to 1945, there was a decline in funded debt from \$11,880 millions to \$8,659 million—a reduction of 27 per cent. Outstanding stock, over the same period, declined from \$7,186 million to \$7,008 million, a reduction of about 2½ per cent. Put in another way, each \$100 share

of railroad stock outstanding in 1930 had \$165 of debt standing between it and unrestricted possession of the railroads' property. In 1945, this debt had been reduced to \$124 per \$100-share of stock. Meantime, total railroad assets had increased about \$1½ billion, or some \$20 per \$100-share of stock. In sum, the ownership interest behind each \$100-share of stock increased by \$61 from 1930 to 1945—but that fact did not prevent stocks selling on the average in 1945 and 1946 for about half the average 1930 price. And, of course, public demand for both passenger and freight service from the railways was much greater in 1945 and 1946 than it was in 1930.

From the foregoing, it may be concluded that the appeal of the railroads to the investor of "venture capital" is not conclusively governed by immediate earnings; nor by the existing and prospective volume of traffic; nor by the ratio of stock to bonds; nor by the "equity" represented by each share. The determinant of investors' attitude—and hence of stock prices—appears to be actual and prospective dividends. These totaled about \$246 million in 1945, and

are not going to be a great deal more than that in 1946—whereas, in 1930, they aggregated \$497 million, or double what they now are.

It is true that, back in the 'twenties when new investment was being made in the railways on a substantial scale, the funds required were secured for the most part from earnings rather than from "outside." Such new securities as were issued took the form, primarily, of funded indebtedness rather than stock. After a long period of low prices for railroad bonds, these securities have now been largely restored to favor—not (as stock prices prove) by any greatly increased optimism on the part of investors as to future railroad earnings, but solely because the quantity of these obligations has diminished so greatly.

If, on the contrary, the volume of bonds were to be increased, without improvement in the outlook for net earnings and dividends, it would appear inevitable that bond prices would again suffer a relapse—which is just another way of saying that, in all probability, no large increments of new funds for capital purposes can be raised by the railroads by the sale of bonds, until the time when

Mileage in the Hands of Receivers or Trustees *

(Figures to 1945, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1945. Figures for 1946 Compiled by *Railway Age*.)

| Year ended | Miles of road operated by receivers or trustees at close of year | Net change during year in miles of road operated | No. of roads in charge of receivers or trustees at close of year |
|--------------------|--|--|--|
| June 30, 1894..... | 40,819 | ..... | 192 |
| 1895..... | 37,856 | -2,963 | 169 |
| 1896..... | 30,475 | -7,380 | 151 |
| 1897..... | 18,862 | -11,614 | 128 |
| 1898..... | 12,745 | -6,117 | 94 |
| 1899..... | 9,853 | -2,892 | 71 |
| 1900..... | 4,178 | -5,675 | 52 |
| 1901..... | 2,497 | -1,681 | 45 |
| 1902..... | 1,475 | -1,022 | 27 |
| 1903..... | 1,185 | -290 | 27 |
| 1904..... | 1,323 | +138 | 28 |
| 1905..... | 796 | -527 | 26 |
| 1906..... | 3,971 | +3,176 | 34 |
| 1907..... | 3,926 | -45 | 29 |
| 1908..... | 9,529 | +5,603 | 52 |
| 1909..... | 10,530 | +1,001 | 44 |
| 1910..... | 5,257 | -5,273 | 39 |
| 1911..... | 4,593 | -664 | 39 |
| 1912..... | 9,786 | +5,193 | 44 |
| 1913..... | 16,286 | +6,500 | 49 |
| 1914..... | 18,608 | +2,322 | 68 |
| 1915..... | 30,223 | +11,615 | 85 |
| 1916..... | 37,353 | +7,130 | 94 |
| Dec. 31, 1916..... | 34,804 | -2,550* | 80 |
| 1917..... | 17,376 | -17,428 | 82 |
| 1918..... | 19,208 | +1,832 | 74 |
| 1919..... | 16,590 | -2,618 | 65 |
| 1920..... | 16,290 | -300 | 61 |
| 1921..... | 13,512 | -2,778 | 68 |
| 1922..... | 15,259 | +1,747 | 64 |
| 1923..... | 12,623 | -2,636 | 64 |
| 1924..... | 8,105 | -4,518 | 61 |
| 1925..... | 18,687 | +10,582 | 53 |
| 1926..... | 17,632 | -1,055 | 45 |
| 1927..... | 16,752 | -880 | 40 |
| 1928..... | 5,256 | -11,496 | 33 |
| 1929..... | 5,703 | +447 | 29 |
| 1930..... | 9,486 | +3,783 | 30 |
| 1931..... | 12,970 | +3,484 | 45 |
| 1932..... | 22,545 | +9,575 | 55 |
| 1933..... | 41,698 | +19,153 | 78 |
| 1934..... | 42,168 | +470 | 80 |
| 1935..... | 68,345 | +26,177 | 87 |
| 1936..... | 69,712 | +1,367 | 91 |
| 1937..... | 70,884 | +1,172 | 109 |
| 1938..... | 76,938 | +6,054 | 109 |
| 1939..... | 77,013 | +75 | 108 |
| 1940..... | 75,270 | -1,743 | 103 |
| 1941..... | 69,859 | -5,411 | 91 |
| 1942..... | 66,904 | -2,955 | 87 |
| 1943..... | 64,758 | -2,146 | 82 |
| 1944..... | 50,497 | -14,261 | 76 |
| 1945..... | 39,714 | -10,783 | 72 |
| 1946..... | 36,044 | -3,670 | 67 |

* Represents decrease for six months.

actual and prospective dividends have pushed average stock prices above 100. In other words, there is no prospect that large amounts of new capital can be raised by the sale of bonds, unless similar amounts could also be raised by the sale of stock, in which case there would be no necessity of resort to the sale of bonds.

These observations, of course, do not apply to equipment trust certificates or notes, which continue to be highly popular with investors—and are, for all practical purposes, the only form of *new* issue for which an attractive market exists. Until other securities are established on a basis where they can yield new funds to the railroads, the carriers will have to rely upon the direct investment of earnings (either current or accumulated) for a supply of new capital, except for equipment.

This source is unsatisfactory for large and sustained new investment—not because such funds, necessarily, would be inadequate; but because management has small incentive and justification for heavy investment of earnings unless previous investments are proving remunerative. If previous investments become sufficiently attractive to make large investments from earnings economically justifiable, then stocks will have risen in price to the point where the selection of the source of new funds can be made from choice and not from lack of alternatives.

The conclusion is inescapable that, under free enterprise (i. e., abstaining either from government ownership or government financing), a supply of capital adequate to keep the railroads abreast with the public demand for their services, is unobtainable, in the long run, by any method short of allowing the railroads earnings which will make their *stocks* attractive to investors. Railroad stocks have not sold at such prices since 1930.

During the past year, security offerings by the railroads—i. e., equipment issues and refunding operations—are shown in an accompanying tabulation by the Securities and Exchange Commission to have been less than half of those in 1945. Details of principal individual issues are also shown in tabulations herewith, while other tables record the slow but steady progress being made in the reorganization of bankrupt properties.

Bonds

Among the leading issues of bonds marketed during the year were the following:

In July the Apalachicola Northern was authorized by the I. C. C. to issue \$645,000 in 4 per cent first mortgage bonds, using the proceeds together with other funds to repay advances of a similar amount made to the road by the St. Joe Paper Company. The bonds, dated June 30, mature serially

over 50 years beginning June 30, 1947, and were sold at 99 per cent of par to a syndicate headed by Clyde C. Pierce Corp., Jacksonville, Fla., and Leedy Wheeler Company, Orlando. The average annual cost will be approximately 4.07 per cent.

In February the Reconstruction Finance Corporation disposed of \$21,371,000 of its Boston & Maine holdings, thereby completing liquidation of the \$40,193,000 of this company's obligations acquired in 1940. The liquidation resulted in a net premium to the agency of \$538,510. The sale involved the B. & M.'s series RR first mortgage 4 per cent bonds, due in 1960, \$1,000,000 of which went to Bear, Stearns & Co., New York, at 102; \$1,371,000, to the Boston & Maine at 101, and \$19,000,000 to Dich & Merle-Smith, New York, also at 101.

In April the Boston & Maine was authorized by the I. C. C. to assume liability for \$1,250,000 of 3 per cent 15-year serial first mortgage bonds of the North Station Industrial Building, Inc., Boston, Mass., covering property leased by the road. John Hancock Mutual Life Insurance Company had agreed to purchase such bonds with a 4 per cent interest rate, which sale was believed to be too high by the Commission and therefore made its approval of the transaction conditional upon a reduction of the rate.

In September the Charleston & Western Carolina was authorized by the I. C. C. to issue \$2,720,000 of first consolidated mortgage series B 5 per cent bonds to be delivered to its parent company, the Atlantic Coast Line, which was to provide funds for the redemption of a like amount

of first-mortgage 5 per cent bonds due October 1. The new issue will mature January 1, 1964.

In March the Detroit, Toledo & Ironton awarded \$9,626,000 of series B first mortgage bonds, maturing in 1976, to Shields & Co. and White Weld & Co., et al. on a bid of 100.325 for a 2¾ per cent coupon. The proceeds of the issue were to be applied to the redemption of 107½ of an equal principal amount of series A 4 per cent first mortgage bonds outstanding, due in 1967.

In November the Duluth, Missabe & Iron Range was authorized by the I. C. C. to issue \$19,200,000 of first mortgage serial bonds, the proceeds to be applied, together with other funds, toward the redemption of \$19,800,000 of outstanding first mortgage 3½ per cent bonds which were due November 1. Subject to Commission approval the bonds were sold to Morgan, Stanley & Co. at al., at 99½ and an average annual cost to the applicant of 2.295 per cent. The bonds mature serially in principal amounts of \$1,200,000, starting October 1, 1947, and ending October 1, 1962. They bear interest, payable on April 1 and October 1 of each year at the rate of 1.15 per cent on October 1, 1947, and increasing to 2.5 per cent on October 1, 1962.

In April, the Great Northern received I. C. C. authorization to issue \$40,000,000 of series P general mortgage 2¾ per cent bonds, due in 1982, and \$30,000,000 of series Q general mortgage 2½ per cent bonds, due in 2010, both issues having been sold at 98.071 to Morgan, Stanley & Co. et al., at an average annual cost of about

Summary of Railroad Receiverships and Trusteeships, 1876 to 1946

| Roads Placed in Receivership or Trusteeship | | | Roads Taken from Receivership or Trusteeship* | | Roads Placed in Receivership or Trusteeship | | | Roads Taken from Receivership or Trusteeship* | |
|---|--------------|--------|---|--------|---|--------------|--------|---|--------|
| Year | No. of roads | Miles | No. of roads | Miles | Year | No. of roads | Miles | No. of roads | Miles |
| 1876.... | 42 | 6,662 | 30 | 3,840 | 1911.... | 5 | 2,606 | 13 | 1,386 |
| 1877.... | 38 | 3,637 | 54 | 3,875 | 1912.... | 13 | 3,784 | 12 | 661 |
| 1878.... | 27 | 2,320 | 48 | 3,906 | 1913.... | 17 | 9,020 | 6 | 1,159 |
| 1879.... | 12 | 1,102 | 65 | 4,909 | 1914.... | 22 | 4,222 | 9 | 1,470 |
| 1880.... | 13 | 885 | 31 | 3,775 | 1915.... | 12 | 20,143 | 11 | 3,914 |
| 1881.... | 5 | 110 | 29 | 2,617 | 1916.... | 9 | 4,439 | 26 | 8,355 |
| 1882.... | 12 | 912 | 16 | 867 | 1917.... | 19 | 2,486 | 20 | 10,963 |
| 1883.... | 11 | 1,990 | 18 | 1,354 | 1918.... | 8 | 3,519 | 11 | 763 |
| 1884.... | 37 | 11,038 | 15 | 710 | 1919.... | 7 | 244 | 8 | 459 |
| 1885.... | 44 | 8,836 | 22 | 3,156 | 1920.... | 10 | 541 | 7 | 380 |
| 1886.... | 13 | 1,799 | 45 | 7,687 | 1921.... | 14 | 1,744 | 11 | 4,173 |
| 1887.... | 9 | 1,046 | 31 | 5,478 | 1922.... | 12 | 4,330 | 15 | 6,151 |
| 1888.... | 22 | 3,270 | 19 | 1,596 | 1923.... | 10 | 2,218 | 8 | 637 |
| 1889.... | 22 | 3,803 | 25 | 2,930 | 1924.... | 11 | 920 | 14 | 3,992 |
| 1890.... | 26 | 2,963 | 29 | 3,825 | 1925.... | 6 | 11,368 | 6 | 638 |
| 1891.... | 26 | 2,159 | 21 | 3,223 | 1926.... | 6 | 88 | 12 | 12,852 |
| 1892.... | 36 | 10,508 | 28 | 1,922 | 1927.... | 6 | 924 | 5 | 142 |
| 1893.... | 74 | 29,340 | 25 | 1,613 | 1928.... | 1 | 19 | 4 | 209 |
| 1894.... | 38 | 7,025 | 42 | 5,643 | 1929.... | 3 | 634 | 5 | 562 |
| 1895.... | 31 | 4,089 | 52 | 12,831 | 1930.... | 4 | 4,752 | 2 | 1,048 |
| 1896.... | 34 | 5,441 | 58 | 13,730 | 1931.... | 19 | 5,195 | 2 | 102 |
| 1897.... | 18 | 1,537 | 42 | 6,675 | 1932.... | 13 | 11,817 | 8 | 394 |
| 1898.... | 18 | 2,069 | 47 | 6,054 | 1933.... | 18 | 21,222 | 2 | 298 |
| 1899.... | 10 | 1,019 | 32 | 4,294 | 1934.... | 1 | 81 | 2 | 40 |
| 1900.... | 16 | 1,165 | 24 | 3,477 | 1935.... | 16 | 29,018 | 5 | 436 |
| 1901.... | 4 | 73 | 17 | 1,139 | 1936.... | 4 | 8 | 3 | 122 |
| 1902.... | 5 | 278 | 20 | 693 | 1937.... | 23 | 1,937 | 2 | 179 |
| 1903.... | 9 | 229 | 13 | 555 | 1938.... | 9 | 6,194 | 8 | 290 |
| 1904.... | 8 | 744 | 13 | 524 | 1939.... | 3 | 733 | 4 | 401 |
| 1905.... | 10 | 3,593 | 6 | 679 | 1940.... | .. | .. | 6 | 3,675 |
| 1906.... | 6 | 204 | 8 | 262 | 1941.... | 1 | 25 | 9 | 5,031 |
| 1907.... | 7 | 317 | 6 | 114 | 1942.... | 4 | 961 | 7 | 394 |
| 1908.... | 24 | 8,009 | 3 | 138 | 1943.... | 3 | 23 | 6 | 13,096 |
| 1909.... | 5 | 859 | 12 | 2,629 | 1944.... | 1 | .. | 8 | 10,833 |
| 1910.... | 7 | 735 | 17 | 1,100 | 1945.... | 1 | 96 | 5 | .. |
| | | | | | 1946.... | .. | .. | 7 | 4,832 |

* Prior to 1938 these figures covered foreclosure sales only.

2.75 per cent. The proceeds and other funds were to be applied to the redemption of the following outstanding general mortgage bonds: \$30,000,000 of 3¾ per cent series L, due in 1970 and callable at 105¼; \$35,000,000 of 3½ per cent series M, due in 1980, callable at 105¾; and \$10,000,000 of 3½ per cent series K, due in 1960 and callable at 105¾. This refunding is expected to result in a net saving of \$8,549,993.

Also in April the Great Northern was authorized by the Commission to refinance an additional \$25,000,000 of the series K by issuing general mortgage 2¼ per cent bonds, series R, in that amount. The bonds, due January 1, 1961, were sold, subsequent to I. C. C. approval, to Morgan, Stanley & Co. on a bid of 99.279 and accrued interest.

In June, the Indianapolis Union sold \$6,500,000 of refunding and improvement mortgage bonds, series G, maturing June 1, 1986, to Halsey, Stuart & Co., at al., on a bid of 98.31 per cent of par for a 2½ per cent coupon, making the average interest cost 2.57 per cent. The bonds were offered by the purchasers to the public at 98¾ per cent to yield 2.55 per cent, and are guaranteed jointly and severally as to interest, principal and sinking fund, by the Pennsylvania and the New York Central. Proceeds of the sale, plus treasury funds, were used to redeem, on September 1, at 107, \$7,679,000 outstanding 3½ per cent refunding and improvement mortgage bonds, series B.

In March, the Litchfield & Madison was given I. C. C. authorization to issue a 10-year installment note not exceeding \$658,000, pursuant to an agreement with the Boatmen's National Bank of St. Louis, Mo., to mature in 10 equal annual installments, the proceeds to be applied to the redemption at 102 of \$658,000 of outstanding first-mortgage 5 per cent bonds. The interest rate on the note is 2½ per cent per year, payable semi-annually.

In April authority was granted by the I. C. C. to the Louisiana & Arkansas to issue at par one first mortgage 4 per cent bond, series D, in the amount of \$14,000,000 to be pledged as collateral for \$14,000,000 1¾ per cent, 3-year promissory notes issued at par. The notes, delivered to the New York Trust Company, Bankers Trust Company, and Union Trust Company of Pittsburgh, Pa., and the \$14,000,000 received from those institutions was to be used to redeem the L. & A.'s outstanding issue of \$14,000,000 first mortgage 5 per cent bonds, series A, due in 1969. The road called the redemption of these bonds at 103 plus accrued interest on June 1. No competitive bidding was required for the sale of the notes due to their short-term maturity.

In May the Maryland & Pennsylvania was given I. C. C. authorization to issue \$700,000 of series C, 6 per cent first consolidated mortgage bonds, due in 1963, of which \$200,000 are to be held in its treasury and \$500,000 pledged as collateral for a loan of \$200,000 from the Mercantile Trust Company, Baltimore, Md., evidenced by a 4 per cent promissory note or notes in that amount, due in 1951. The proceeds of the issue were to be used to redeem a loan from the R. F. C.

In January the I. C. C. authorized the Missouri-Kansas-Texas to pledge for not more than 2 years \$13,152,600 of its series E, prior lien mortgage 5 per cent bonds as collateral security for \$5,000,000 of 1¾ per cent notes for which the Central Hanover Bank & Trust Co. was to advance a loan in that amount for purposes of purchasing the road's first mortgage bonds or prior lien mortgage bonds. In May, the Commission granted the M-K-T authority to issue a \$4,750,000 promissory note at 1¾ per cent to the Republic National Bank of Dallas, Tex. The proceeds of this note were to be used to pay the \$4,750,000 balance of the Central Hanover Bank & Trust Co. noted above.

In June the Nashville, Chattanooga & St. Louis was given I. C. C. authority to issue \$15,000,000 of 3 per cent first mortgage bonds, series B to be sold, subsequent to Commission approval, at 99.319, to a syndicate headed by the First Boston Corp. The proceeds were to be applied toward redemption on August 1, 1946, of a similar amount of series A first mortgage 4 per cent gold bonds, due February 1, 1978. The new issue, dated February 1, 1946, will mature February 1, 1986. The Louisville & Nashville was authorized to assume liability as guarantor of the new issue.

In May, the I. C. C. granted authorization to the New York, Chicago & St. Louis to issue \$41,500,000 of 3 per cent coupon rate 40-year refunding mortgage bonds, series F, averaging an annual interest cost of 2.935 per cent, to be sold at 101.529 and accrued interest, to Halsey, Stuart & Co., et al. The proceeds together with other funds were applied to the redemption on July 1, at 105½ of \$41,796,000 of 3¾ per cent refunding mortgage bonds, series D, due in 1975.

In September the Norfolk Southern was authorized to issue \$3,200,000 of 3 per cent first-mortgage sinking-fund bonds, series B, proceeds to be applied to the retirement on January 1, 1947, at 103, of \$3,393,300 outstanding series A 4½ per cent bonds, due July 1, 1998. The issue was exempt from competitive bidding requirements and was to be sold to the Connecticut Mutual Life Insurance Company, \$900,000; New England Mutual Life Insurance Company, \$800,000; Massachusetts Mutual Life Insurance Company, \$750,000; Mutual Benefit Life Insurance Company, \$500,000; and Guardian Life Insurance Company, \$250,000. The bonds, dated July 1, 1946, mature July 1, 1986.

The Pennsylvania in April was authorized to issue to Halsey, Stuart & Co. \$30,000,000 of secured serial notes, the last of which would mature in 1966—the interest cost to the railroad being 1.96 per cent, and the proceeds being used toward the retirement of 3½ per cent notes.

In March the Savannah & Atlanta was authorized by the I. C. C. to issue \$950,000 of 3¾ per cent first mortgage bonds due in 1964, the proceeds of which were to be used to retire the unpaid portion of an R. F. C. loan amounting to \$774,000 and for property improvements. The new issue was sold at par to Welsh, Davis & Co., Chicago.

In February the Southern Pacific awarded \$50,000,000 of new first mortgage bonds,

series E, maturing January 1, 1986, to Kuhn, Loeb & Co. on a bid of 100.6599 for a 2¾ per cent coupon, a net interest cost to the railroad of about 2.847 per cent. The proceeds of the issue were to be applied, with other funds, to the redemption at 103¾ of a like principal amount of series B 3¾ per cent first mortgage bonds due in 1986, with a net reduction in charges to maturity of \$12,993,223 expected to result from the operation. The bonds were reoffered at 101½, to yield 2.81 per cent to maturity.

Also in February the road sold another \$50,000,000 of new first mortgage bonds, series F, maturing January 1, 1996, to Halsey, Stuart & Co., et al., on a bid of 99.52 for a 2¾ per cent coupon, a net interest cost to the road of 2.768 per cent. The proceeds were to be used to redeem at 103½ an equal amount of series C 3¾ per cent first mortgage bonds, also due in 1996, which were issued in 1945. A net reduction in interest and other charges to maturity of \$17,406,703 was expected to result from the transaction. The bonds were reoffered at 100.

In March the S. P. sold \$25,000,000 of 2¾ per cent first mortgage bonds, series G, to Kuhn, Loeb & Co. at 98.319, an annual interest cost to the railroad of about 2.386 per cent. The proceeds and other funds were to be applied to the retirement at 101½ of an equal principal amount of series A first mortgage 2¾ per cent bonds, due in 1961, with an estimated reduction in interest and other charges of \$1,198,388. The bonds were reoffered at 98¾.

The Texas & New Orleans was authorized by the I. C. C. in May to issue \$80,000,000 of first and refunding mortgage bonds (some maturing in 1970 and some in 1990), guaranteed by the Southern Pacific, to be sold to a syndicate headed by Kuhn, Loeb & Co. at an average interest cost of 3.44 per cent. The proceeds were used to retire varied issues of outstanding bonds and to simplify the T. & N. O.'s structure of indebtedness.

In September the Union was authorized by the I. C. C. to issue \$7,900,000 of 50-year series A first and refunding mortgage 3 per cent bonds, the proceeds of which were to be applied toward the retirement of \$2,000,000 of first mortgage 5 per cent gold bonds and \$5,900,000 of 6 per cent gold debentures, both due September 1, 1946. The bonds mature August 1, 1996, are subject to earlier redemption at the option of the applicant at various prices and were sold at par to the United States Steel Corporation, which controls the Union through stock ownership.

In February the Union Pacific sold \$44,493,000 of 2¾ per cent debentures, maturing February 1, 1976, to Halsey, Stuart & Co., et al., on a bid of 107.789, making the average annual cost to the road about 2½ per cent. The proceeds were to be applied, in part, to the retirement at 103 of \$44,717,000 of 3½ per cent debenture bonds due in 1970 and 1971 now outstanding. Without regard to income tax adjustments, the transaction was expected to result in a net saving to maturity of \$8,844,860. The bonds were reoffered

(Continued on page 99)



Purchases of miscellaneous materials and supplies reached new heights during 1946 and prospects indicate a prolonged demand as enlarged railway modernization and improvement programs get under way

1946 Railway Buying Near 1923 Peak

Total purchases of \$2,231,707,000 were approximately 18 per cent greater than for 1945, largest since 1923—Equipment orders (\$629,510,000) almost double (196.6 per cent) last year's total

RAILWAY buying reached a 23-year high during 1946, when purchases of materials, supplies, equipment and fuel totaled \$2,231,707,000, an increase of \$339,203,000, compared with 1945, and greater than for any comparable period since 1923, according to pre-

By FRED W. SMITH
Associate Editor
Purchases & Stores Department

liminary estimates prepared by *Railway Age*, based upon regular monthly reports of a large majority of the carriers involved. The 1946 total includes \$1,048,232,000 of materials and supplies received from manufacturers, \$629,510,000 of locomotives and cars ordered from manufacturers and \$553,965,000 of fuel.

It is significant that, while total 1946 purchases (including fuel and equipment) increased 18 per cent compared with 1945, the value of materials and supplies received from manufacturers increased 25.5 per cent (\$340,393,000) and the value of orders placed with manufacturers for rolling stock increased 96.6 per cent.

Of the \$629,510,000 of new cars and locomotives ordered by the railways during 1946, approximately \$189,761,000 was for 43,325 new freight train cars, \$229,600,000 was for 1,986 new passen-

ger-train cars, \$202,399,000 was for 763 new Diesel-electric locomotives, and \$7,750,000 was for 48 new steam locomotives. Railway equipment orders received a substantial boost in mid-October with the Chesapeake & Ohio's \$26-million passenger car order, and the Union Pacific's late-December order for 64 Diesel-electric locomotives further swelled the huge equipment backlog. The latter order consisted of 28 6,000-hp. freight locomotives, two 6,000-hp. passenger locomotives, five 4,500-hp. passenger locomotives and 29 switchers. This order for 64 units represents a cash outlay of approximately \$22 million, and is said to be the largest for Diesel equipment in railroad history.

The \$1,048,232,000 spent by Class I roads last year for materials and supplies of all kinds, with the exception of fuel, was 3 per cent greater than the \$1,017,249,000 spent for these products in the preceding year; it was 2 per cent (\$23,535,000) more than the \$1,024,697,000 expenditure for similar materials and supplies during 1944; topped similar 1943 purchases by 21 per cent; was 26

Table I
Comparative Purchases of Equipment, Materials and Fuel by All Class I Railroads for 1946 and 1941

| | 1946* (000) | 1941 (000) | Change Per Cent |
|--------------------|----------------|---------------|-----------------------|
| Equipment** | \$629,510 | \$414,690 | +51.8 |
| Rails | 56,922 | 52,234 | +9.0 |
| Crossties | 90,776 | 49,494 | +83.0 |
| All other Material | 900,534 | 709,781 | +27.0 |

* Total From Manufacturers \$1,677,742 \$1,226,199 +36.8
Fuel 553,965 349,765 +58.0

Grand Total \$2,231,707 \$1,575,964 +41.6

* Preliminary estimates by *Railway Age* of materials and supplies received.

** Amount of equipment placed on order. Total railway purchases of all durable goods from manufacturers and charged to both capital and operation were larger in both years than the figures in the table.

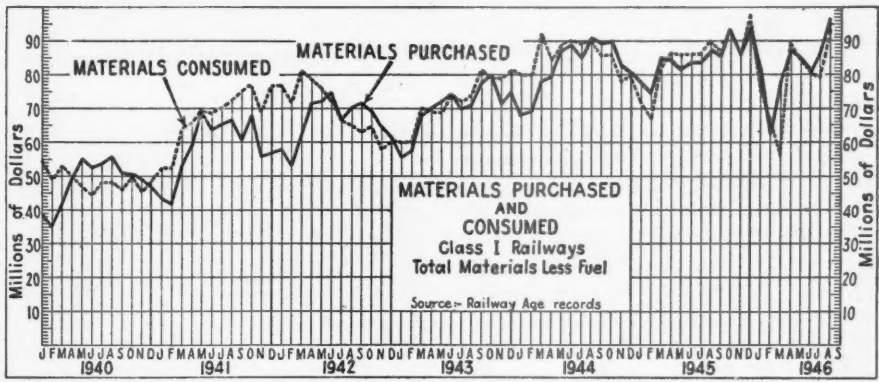
per cent more than the 1942 total; and surpassed the \$811,509,000 spent for the same purpose during 1941 by a full 29 per cent.

Purchases of miscellaneous materials and supplies (excluding fuel) during 1946 were greater than in any year since 1926, being 3.5 per cent (\$37,446,000) below the figure for that year. They were approximately \$72 million less than the \$1,120,903,000 spent for this purpose during 1923.

Record in Manufactured Goods

High-volume buying of miscellaneous materials and supplies (excluding crossties, rail and fuel) required for the general maintenance of equipment and fixed property persisted throughout the last half of 1946 and established in that year a new record in this category. The 1946 expenditure for these items amounted to \$900,534,000—or \$37,712,000 more than was spent for similar materials and supplies during 1945. The 1946 high also exceeded the \$863,732,000 spent for the same purpose during 1944 by more than 4 per cent; surpassed the 1943 expenditure by 24 per cent; topped the \$714,676,000 spent for this purpose during 1942 by 26 per cent; and was 27 per cent (\$190,753,000) greater than the \$709,781,000 spent for miscellaneous materials and supplies during 1941.

Crosstie purchases during 1946 totaled \$90,776,000, an increase of \$13,387,000,



Although high-volume buying of materials and supplies (excluding fuel) continued throughout 1946 the above chart indicates that consumption was also on a high level and exceeded purchases during February and April

or approximately 17 per cent, compared with 1945, and were also greater than for any comparable period since 1930. Tie purchases during 1946 were 7 per cent, 9 per cent, 44 per cent and 83 per cent greater, respectively, than 1944, 1943, 1942 and 1941 purchases.

Although procurement officers in general experienced less difficulty in meeting their crosstie requirements during 1946, indications are that total tie insertions for the year did not exceed 37,000,000, or approximately 7,000,000 less than those during the previous year. However, this drop is attributed to a shortage in track labor, as well as to various other factors, and does not reflect a true pic-

ture of the over-all tie situation. Most crosstie producers anticipate maintaining production schedules in 1947 that will see the delivery of as many, if not more, ties this year than were produced during 1946, and agree that, barring unforeseen difficulties, they should be able to meet the immediate needs of the carriers.

Rail Deliveries Lower

The increased demands of all industry for steel, plus serious work stoppages caused by the steel and coal strikes, as well as shortages of scrap and other vital material, seriously affected rail deliveries throughout 1946. As a result, rail de-

Table II—Monthly Purchases of Materials and Supplies, 1941-1946—Class I Railroads

| Miscellaneous Materials and Supplies (excluding crossties, rail and fuel)—In Thousands | | | | | | | Crossties—In Thousands | | | | | | |
|--|-----------|-----------|-----------|-----------|-----------|-----------|---|-------------|-------------|-------------|-------------|-------------|-------------|
| | 1946* | 1945 | 1944 | 1943 | 1942 | 1941 | | 1946* | 1945 | 1944 | 1943 | 1942 | 1941 |
| January..... | \$69,808 | \$66,609 | \$64,987 | \$49,000 | \$68,988 | \$45,387 | | \$5,786 | \$5,601 | \$6,895 | \$4,037 | \$4,871 | \$3,434 |
| February..... | 55,587 | 63,245 | 65,693 | 48,407 | 63,148 | 43,400 | | 6,084 | 5,459 | 6,675 | 4,530 | 4,814 | 3,475 |
| March..... | 67,026 | 72,791 | 75,033 | 56,911 | 71,103 | 53,988 | | 7,937 | 5,540 | 7,370 | 6,481 | 6,100 | 4,042 |
| April..... | 73,787 | 72,869 | 69,337 | 56,412 | 66,409 | 55,377 | | 7,672 | 5,647 | 6,745 | 6,625 | 6,143 | 4,317 |
| May..... | 71,960 | 69,813 | 73,446 | 55,170 | 62,812 | 59,412 | | 7,866 | 6,484 | 7,410 | 6,758 | 6,156 | 4,321 |
| June..... | 70,139 | 70,835 | 74,351 | 60,923 | 59,822 | 59,597 | | 6,967 | 6,138 | 7,589 | 6,826 | 6,138 | 4,025 |
| July..... | 72,435 | 71,211 | 73,899 | 62,733 | 54,873 | 61,026 | | 8,014 | 5,778 | 7,475 | 7,550 | 5,682 | 4,146 |
| August..... | 82,231 | 74,771 | 76,941 | 62,714 | 54,856 | 64,278 | | 7,982 | 6,594 | 7,532 | 8,156 | 5,609 | 4,297 |
| September..... | 84,114 | 71,041 | 75,783 | 68,564 | 54,087 | 65,618 | | 8,052 | 7,081 | 7,866 | 9,032 | 5,127 | 4,347 |
| October..... | 84,068 | 79,995 | 75,945 | 67,077 | 56,689 | 70,141 | | 8,278 | 8,307 | 7,101 | 8,301 | 4,624 | 4,350 |
| November..... | 83,775 | 72,294 | 70,697 | 67,532 | 49,391 | 61,960 | | 7,887 | 7,198 | 6,618 | 7,395 | 4,073 | 4,074 |
| December..... | 85,604 | 77,348 | 67,620 | 68,066 | 52,498 | 69,597 | | 8,251 | 7,562 | 5,926 | 7,711 | 3,816 | 4,666 |
| | \$900,534 | \$862,822 | \$863,732 | \$723,509 | \$714,676 | \$709,781 | | \$90,776 | \$77,389 | \$85,202 | \$83,402 | \$63,153 | \$49,494 |
| Rails—In Thousands | | | | | | | Total Materials and Supplies (Less Fuel)—In Thousands | | | | | | |
| | 1946* | 1945 | 1944 | 1943 | 1942 | 1941 | | 1946* | 1945 | 1944 | 1943 | 1942 | 1941 |
| January..... | \$4,830 | \$5,734 | \$6,423 | \$4,811 | \$3,071 | \$3,459 | | \$80,424 | \$77,944 | \$78,305 | \$57,848 | \$76,930 | \$52,280 |
| February..... | 799 | 5,962 | 6,264 | 4,340 | 3,813 | 5,289 | | 62,470 | 74,666 | 78,632 | 57,277 | 71,775 | 52,164 |
| March..... | 3,086 | 6,531 | 7,700 | 4,718 | 3,766 | 5,160 | | 78,049 | 84,862 | 90,103 | 68,110 | 80,969 | 63,190 |
| April..... | 5,892 | 5,621 | 6,175 | 4,181 | 5,827 | 4,850 | | 87,351 | 84,137 | 82,257 | 67,218 | 78,379 | 64,544 |
| May..... | 4,716 | 5,184 | 6,188 | 4,599 | 6,637 | 6,186 | | 84,542 | 81,481 | 87,044 | 66,527 | 75,605 | 69,919 |
| June..... | 3,646 | 6,627 | 6,508 | 4,584 | 5,829 | 4,861 | | 80,752 | 83,600 | 88,448 | 72,333 | 71,789 | 68,483 |
| July..... | 5,507 | 6,989 | 5,597 | 4,332 | 5,569 | 4,690 | | 85,956 | 83,978 | 86,971 | 74,615 | 66,124 | 69,862 |
| August..... | 6,298 | 5,977 | 6,358 | 4,396 | 4,620 | 3,873 | | 96,511 | 87,342 | 90,831 | 75,266 | 65,085 | 72,448 |
| September..... | 6,999 | 7,691 | 5,647 | 5,013 | 3,620 | 5,503 | | 99,165 | 85,813 | 89,296 | 83,209 | 62,834 | 75,468 |
| October..... | 4,967 | 5,723 | 6,834 | 5,721 | 3,765 | 2,960 | | 97,313 | 94,025 | 89,880 | 81,099 | 65,078 | 77,451 |
| November..... | 4,102 | 6,321 | 5,338 | 5,346 | 4,259 | 3,184 | | 95,764 | 85,813 | 82,653 | 80,273 | 57,723 | 69,218 |
| December..... | 6,080 | 8,678 | 6,731 | 7,433 | 4,871 | 2,219 | | 99,935 | 93,588 | 80,277 | 83,210 | 61,185 | 76,482 |
| | \$56,922 | \$77,038 | \$75,763 | \$60,074 | \$55,647 | \$52,234 | | \$1,048,232 | \$1,017,249 | \$1,024,697 | \$866,985 | \$833,476 | \$811,509 |
| Fuel—In Thousands | | | | | | | Total Material, Supplies and Fuel—In Thousands | | | | | | |
| | 1946* | 1945 | 1944 | 1943 | 1942 | 1941 | | 1946* | 1945 | 1944 | 1943 | 1942 | 1941 |
| January..... | \$51,683 | \$47,826 | \$50,341 | \$39,883 | \$32,851 | \$27,254 | | \$132,107 | \$125,770 | \$128,646 | \$97,731 | \$109,781 | \$79,534 |
| February..... | 49,702 | 43,349 | 50,041 | 41,542 | 31,991 | 27,894 | | 112,172 | 118,015 | 128,673 | 98,819 | 103,766 | 80,058 |
| March..... | 54,270 | 48,538 | 53,277 | 49,297 | 34,025 | 31,113 | | 132,319 | 133,400 | 143,380 | 117,407 | 114,994 | 94,303 |
| April..... | 29,546 | 45,601 | 51,655 | 48,369 | 35,230 | 19,198 | | 116,897 | 129,738 | 133,912 | 115,587 | 113,609 | 83,742 |
| May..... | 30,499 | 48,638 | 51,039 | 44,991 | 34,701 | 25,544 | | 115,041 | 130,119 | 138,083 | 111,518 | 110,306 | 95,463 |
| June..... | 41,224 | 48,215 | 49,706 | 38,019 | 35,290 | 27,331 | | 121,976 | 131,815 | 138,154 | 110,352 | 107,079 | 95,814 |
| July..... | 50,974 | 47,049 | 47,384 | 43,695 | 35,152 | 29,693 | | 136,930 | 131,027 | 134,355 | 118,310 | 101,276 | 99,555 |
| August..... | 49,776 | 45,402 | 47,954 | 45,403 | 35,468 | 30,527 | | 146,287 | 132,744 | 138,785 | 120,669 | 100,553 | 102,975 |
| September..... | 52,203 | 44,325 | 43,977 | 45,702 | 36,318 | 31,597 | | 151,368 | 130,138 | 133,273 | 128,911 | 99,152 | 107,065 |
| October..... | 52,703 | 42,541 | 46,974 | 42,405 | 37,784 | 34,335 | | 150,016 | 136,566 | 136,854 | 123,504 | 102,862 | 111,786 |
| November..... | 41,410 | 42,674 | 47,057 | 40,991 | 37,126 | 31,054 | | 137,174 | 128,487 | 129,710 | 121,264 | 94,849 | 100,272 |
| December..... | 49,975 | 50,997 | 46,427 | 46,999 | 40,399 | 34,225 | | 149,910 | 144,585 | 126,704 | 130,209 | 101,584 | 110,707 |
| | \$553,965 | \$555,155 | \$585,832 | \$527,296 | \$426,335 | \$349,765 | | \$1,602,197 | \$1,572,404 | \$1,610,529 | \$1,394,281 | \$1,259,811 | \$1,161,274 |

* Subject to revision.

liveries tobogganed below those of the previous three years, and, consequently, seriously upset the renewal programs planned by numerous roads. Rail purchases last year amounted to \$56,922,000—26 per cent less than the 1945 expenditure, which aggregated \$77,038,000. The 1946 total also slumped 25 per cent below 1944 rail deliveries and 5 per cent below the 1943 total; but it exceeded the \$55,647,000 spent for this material during 1942 by 2 per cent, and topped the \$52,234,000 expended during pre-war 1941 by 9 per cent.

Purchases of coal and petroleum fuel products aggregated \$553,965,000—\$1,190,000 less than the \$555,155,000 spent for these products during the preceding year, and 5.5 per cent, or \$31,867,000, below the 1944 expenditure. However, with the exception of the 1944 and 1945 fuel purchases, the 1946 total was greater than for any other year since 1923. Furthermore, it also exceeded the \$527,296,000 expended for similar supplies during 1943 by 5 per cent; topped the 1942 total by 30 per cent; and surpassed the \$349,765,000 spent for fuel in 1941 by 58 per cent.

Turn Came in April

The month of April, 1946, as will be seen on the chart of "Materials Purchased and Consumed," marked a turning point in the relationship of materials and supplies (excluding fuel) purchased and consumed during 1946. Since that time the value of materials and supplies

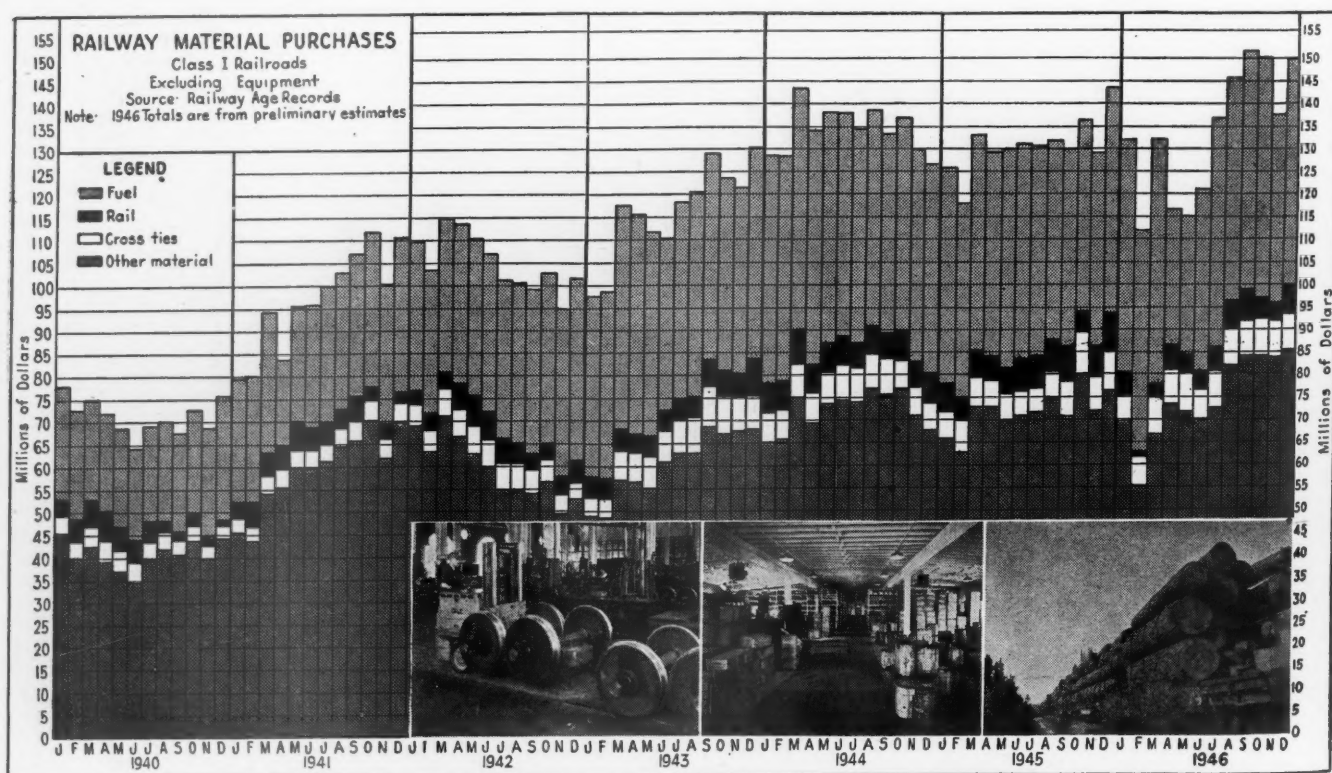
purchased has consistently exceeded the amounts used. Purchases of these commodities during the first eight months of 1946 averaged \$82,056,000, compared with \$82,251,000 during the correspond-

ing period of 1945, and consumption during the same eight months last year averaged \$77,978,000, while in the previous year it averaged more than \$81,587,000 each month. Inventories of these items

Table III
Materials and Supplies in Stock—Class I Railroads

| | Fuel (000) | Rail New & S. H. (000) | Cross-ties (000) | Stores stock (000) | Scrap (000) | Total (000) |
|------------------|---------------|------------------------------|---------------------|--------------------------|----------------|----------------|
| Year 1944 | | | | | | |
| January 1..... | \$50,221 | \$22,342 | \$67,964 | \$382,566 | \$9,628 | \$532,721 |
| February 1..... | 49,056 | 24,331 | 72,039 | 387,899 | 9,937 | 543,262 |
| March 1..... | 49,749 | 25,199 | 76,254 | 393,892 | 9,925 | 555,019 |
| April 1..... | 49,938 | 26,923 | 81,525 | 400,722 | 10,334 | 569,442 |
| May 1..... | 51,320 | 23,081 | 80,463 | 410,114 | 10,319 | 575,297 |
| June 1..... | 56,885 | 22,637 | 79,004 | 413,410 | 10,346 | 582,282 |
| July 1..... | 62,558 | 22,729 | 75,244 | 418,408 | 9,683 | 588,622 |
| August 1..... | 64,515 | 23,190 | 75,004 | 422,002 | 9,682 | 594,393 |
| September 1..... | 67,538 | 22,324 | 71,306 | 427,277 | 10,292 | 598,737 |
| October 1..... | 67,357 | 22,253 | 70,322 | 430,811 | 11,488 | 602,231 |
| November 1..... | 66,997 | 24,392 | 70,052 | 435,141 | 9,216 | 605,798 |
| December 1..... | 64,723 | 23,577 | 69,875 | 440,470 | 9,592 | 608,237 |
| Year 1945 | | | | | | |
| January 1..... | 59,182 | 24,292 | 72,434 | 437,575 | 10,155 | 603,638 |
| February 1..... | 56,398 | 25,149 | 75,259 | 440,353 | 10,021 | 607,180 |
| March 1..... | 52,237 | 26,760 | 78,090 | 439,922 | 14,093 | 611,102 |
| April 1..... | 52,313 | 27,142 | 78,236 | 441,106 | 15,345 | 614,142 |
| May 1..... | 51,236 | 26,057 | 74,792 | 448,326 | 10,414 | 610,825 |
| June 1..... | 51,402 | 24,238 | 70,302 | 450,437 | 10,110 | 606,489 |
| July 1..... | 53,708 | 25,213 | 67,450 | 450,773 | 9,494 | 606,638 |
| August 1..... | 56,248 | 26,332 | 66,422 | 449,821 | 9,280 | 608,103 |
| September 1..... | 55,333 | 25,611 | 62,070 | 448,110 | 13,979 | 605,103 |
| October 1..... | 57,279 | 25,158 | 63,300 | 450,008 | 10,183 | 605,928 |
| November 1..... | 54,710 | 23,942 | 64,000 | 450,689 | 10,275 | 603,616 |
| December 1..... | 54,685 | 23,624 | 65,872 | 448,990 | 10,104 | 603,275 |
| Year 1946* | | | | | | |
| January 1..... | 51,816 | 24,840 | 72,519 | 435,326 | 11,258 | 595,759 |
| February 1..... | 55,613 | 22,439 | 75,886 | 439,184 | 11,677 | 604,799 |
| March 1..... | 61,588 | 21,892 | 76,253 | 435,455 | 11,542 | 606,730 |
| April 1..... | 48,993 | 24,064 | 80,724 | 451,262 | 11,368 | 616,411 |
| May..... | 42,918 | 24,119 | 77,413 | 452,861 | 10,959 | 608,270 |
| June 1..... | 42,875 | 23,200 | 75,953 | 455,860 | 10,872 | 608,760 |
| July 1..... | 44,587 | 22,486 | 76,163 | 456,671 | 11,040 | 610,947 |
| August 1..... | 46,625 | 24,206 | 78,698 | 458,774 | 11,459 | 619,762 |
| September 1..... | 51,888 | 25,165 | 73,997 | 465,503 | 11,557 | 628,110 |

* Subject to revision.



Despite critical shortages, railway buying maintained a fast pace during 1946—
Materials and supplies purchased from manufacturers up \$30,983,000 over 1945

increased from \$532,685,000 on January 1, 1946, to \$564,595,000 on September 1, 1946,—the latest date for which information is available at this writing. Although inventories of these commodities increased \$31,910,000, or 6 per cent, this increase does not represent a corresponding gain in material quantities, for while the prices of some few articles have remained more or less stationary, the great majority of items included in this category have registered substantial gains in prices over those prevailing one year earlier.

Inventory Values at New High

The value of all materials (including fuel and scrap) stocked by Class I railroads amounted to \$628,110,000 on September 1, 1946, according to a report of the Interstate Commerce Commission. This total reflects an increase of approximately 4 per cent compared with the figure for the same day one year earlier. Inventories registered substantial gains through April, but sagged for the next two months; however, they established a new all-time high (\$619,762,000) in August, which, in turn was surpassed by the \$628,110,000 September balance.

Inventory values of fuel reflect the serious set-backs the carriers suffered in 1946 compared with previous years. Despite substantial price increases, fuel inventories on April 1, 1946, amounted to only \$48,993,000, compared with \$52,313,000 on the same day of 1945. Moreover, fuel inventories on September 1, 1946, aggregated \$51,937,000, or 6 per cent less than the \$55,333,000 supply on the comparable day of 1945, and were 23 per cent (\$15,601,000) less than the fuel supply on September 1, 1944.

Crosstie stocks on September 1 totaled \$73,660,000, a gain of \$11,590,000 over the supply on the corresponding day one year earlier; they were also \$2,354,000 (3 per cent) greater than the tie inventory on September 1, 1944; and surpassed the \$59,185,000 supply on the comparable day of 1943 by 24 per cent, or \$14,475,000.

Although September scrap balances were 3 per cent higher than the January 1, 1946, total, they sagged 18 per cent (\$2,401,000) below the scrap total one year earlier. However, the September (1946) total topped the September (1944) total by 12 per cent and was 35 per cent greater than the scrap supply on the corresponding day of 1943.

AS THE CHIEF FREIGHT-CARRYING AGENCY of the nation, new capital is required constantly by the railroads for the modernization and improvement of their facilities. And adequate capital can be secured on satisfactory terms only if it is fairly compensated. The only way to avoid another railroad rate increase is to halt the rise in wages and other operating costs.—N. Y. Journal of Commerce.

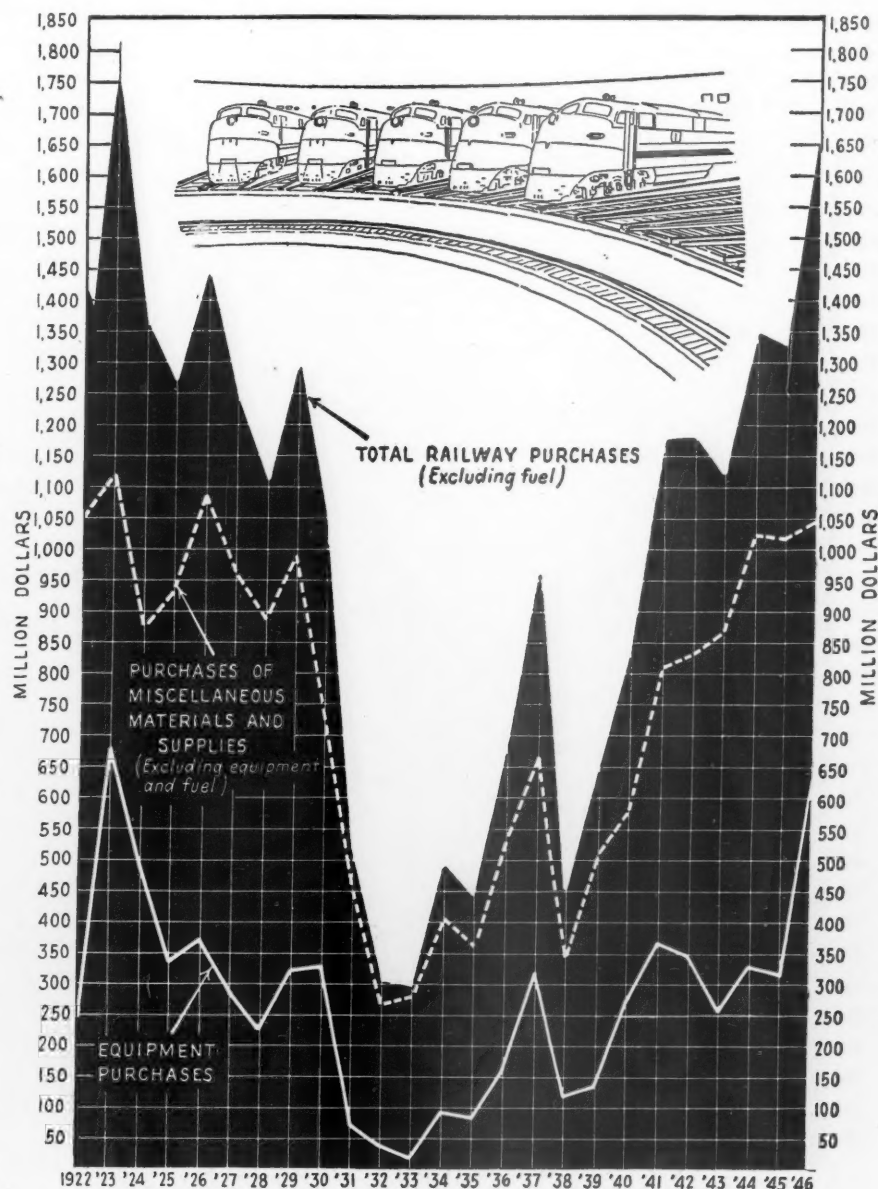
Table IV
Annual Purchases of Materials, Supplies and Equipment—
Class I Railroads

| | Fuel (000) | Rail (000) | Cross- ties (000) | Other material (000) | Total (000) | Total less fuel (000) | Equip- ment x (000) | Grand Total equip., mtls. & fuel (000) |
|------------|---------------|---------------|-------------------------|----------------------------|----------------|--------------------------------|---------------------------|---|
| 1929..... | \$336,805 | \$88,735 | \$143,874 | \$759,186 | \$1,328,600 | \$991,795 | \$397,121 | \$1,725,721 |
| 1930..... | 308,277 | 60,980 | 127,652 | 538,591 | 1,035,500 | 727,223 | 146,471 | 1,181,971 |
| 1931..... | 244,500 | 41,500 | 44,000 | 365,000 | 695,000 | 450,500 | 28,873 | 723,873 |
| 1932..... | 178,250 | 15,500 | 27,550 | 223,700 | 445,000 | 266,750 | 2,623 | 447,623 |
| 1933..... | 179,150 | 10,650 | 19,750 | 248,200 | 457,750 | 278,600 | 5,857 | 463,607 |
| 1934..... | 220,000 | 33,200 | 39,700 | 332,100 | 625,000 | 405,000 | 66,850 | 691,850 |
| 1935..... | 232,400 | 20,354 | 33,780 | 306,593 | 593,127 | 360,727 | 35,696 | 628,823 |
| 1936..... | 271,398 | 37,237 | 41,360 | 452,309 | 802,304 | 530,906 | 240,594 | 1,042,898 |
| 1937..... | 293,540 | 44,935 | 58,361 | 562,100 | 958,936 | 665,396 | 194,153 | 1,153,089 |
| 1938..... | 243,889 | 23,920 | 37,911 | 277,091 | 582,811 | 338,922 | 74,006 | 656,817 |
| 1939..... | 257,880 | 38,340 | 39,760 | 434,394 | 770,374 | 512,494 | 188,838 | 959,212 |
| 1940..... | 273,556 | 45,065 | 47,855 | 487,987 | 854,463 | 580,907 | 264,943 | 1,119,406 |
| 1941..... | 349,765 | 52,234 | 49,494 | 709,781 | 1,161,274 | 811,509 | 414,690 | 1,575,964 |
| 1942..... | 426,335 | 55,647 | 63,153 | 714,676 | 1,259,811 | 833,476 | 325,000† | 1,584,811 |
| 1943..... | 527,296 | 60,074 | 83,402 | 723,509 | 1,394,281 | 866,985 | 248,000† | 1,642,281 |
| 1944..... | 585,832 | 75,763 | 85,202 | 863,732 | 1,610,529 | 1,024,697 | 255,000 | 1,865,529 |
| 1945..... | 555,155 | 77,038 | 77,389 | 862,822 | 1,572,404 | 1,017,249 | 320,100 | 1,892,504 |
| 1946*..... | 553,965 | 56,922 | 90,776 | 900,534 | 1,602,197 | 1,048,232 | 629,510 | 2,231,707 |

* Preliminary Estimates.

x Estimated value of orders for new locomotives and cars.

† Estimated value of orders for new locomotives and cars built by equipment builders and placed in service during 1942 and 1943.



Although railway buying (excluding fuel) during 1946 jumped \$340,393,000 above the 1945 total (\$1,677,742,000) it is still below the peak (\$1,802,627,000) established in 1923. The 1946 total includes equipment orders reported through December 24

Equipment Price Increases Restrained

ACCOMPANYING tables show unit prices of typical freight and passenger cars and locomotives for which Class I railroads arranged financing during 1946. Data were obtained principally from reports of the Interstate Commerce Commission authorizing issues of notes on equipment trust certificates, the proceeds of which were applied to the acquisition of this equipment. Descriptive information in these documents is limited, and it has been supplemented from other sources in some instances.

Price figures in these tabulations indicate trends but many variables, most of which are beyond the scope of these computations, affect their usefulness in measuring unit costs of individual types of cars or locomotives. Apparent substantial differences in prices on what appear to be very similar products may be due to differences in dates orders were placed, but other factors are even more important, such as the structural materials specified and the types and variety of specialties applied. Passenger-train equipment is particularly subject to these influences.

Comparisons with prices prevailing in 1941 are significant when considered in the light of corresponding railroad rate levels. Pre-war 50-ton box cars cost around \$2,800; 70-ton gondolas about \$2,700; and 50-ton hoppers \$2,400. A 1,000-hp. Diesel-electric switcher cost about \$79,000 in 1941, and a 2,000-hp. passenger type around \$175,000. Dining cars were then some \$88,000 each; coaches ranged from \$49,000 to \$65,000; and head-end cars were about \$48,000. Sleeping car prices were not indicated in the 1941 reports.

Passenger-Train Car Prices

| No. bought | Type | Construction | Price |
|------------|--------------------------------|--------------------|----------|
| 9 | sleeping | high tensile steel | \$95,000 |
| 2 | dining | stainless steel | 111,130 |
| 2 | tavern-lounge | stainless steel | 106,680 |
| 7 | 16-roomette, 3-bedr. 1 comp. | steel | 116,000 |
| 3 | baggage-dormitory | aluminum & steel | 85,000 |
| 2 | lunch ctr.-diner | aluminum & steel | 114,000 |
| 4 | 48-seat dining | aluminum & steel | 110,000 |
| 1 | cafe-lounge | aluminum & steel | 120,000 |
| 3 | club-lounge | aluminum & steel | 99,000 |
| 2 | mail-storage | aluminum & steel | 70,000 |
| 1 | baggage-mail | aluminum & steel | 71,000 |
| 1 | 2-draw. 4-bedr. 4 comp. | aluminum & steel | 113,000 |
| 1 | 6-section, 6 roomette, 4-bedr. | aluminum & steel | 117,000 |
| 2 | 4-bedr. 16-roomette | aluminum & steel | 116,500 |
| 26 | 64-pass. coach | steel | 83,000 |
| 1 | 56-pass. coach | steel | 88,000 |
| 1 | cafe-coach | alloy steel | 115,000 |
| 4 | mail-baggage | alloy steel | 67,000 |
| 1 | dining | alloy steel | 140,000 |
| 9 | 35-pass. parlor | steel | 81,000 |
| 4 | tap-diner-lng. | alloy steel | 113,000 |
| 12 | 54-pass. coach | steel | 78,877 |
| 10 | 52-pass. coach | steel | 79,645 |
| 70 | 44-pass. coach | steel | 64,000 |
| 5 | baggage-lounge | steel | 76,000 |
| 5 | dining | high tensile steel | 79,000 |
| 5 | kitchen-dormitory | high tensile steel | 86,000 |
| 5 | obs.-lng.-buff. | steel | 86,000 |
| 2 | baggage | steel | 61,684 |
| 2 | mail-express | steel | 66,579 |
| 4 | coach-obs. | steel | 92,298 |
| 4 | coach-lng. | steel | 89,189 |
| 2 | lounge-diner | steel | 128,307 |
| 3 | mail-baggage | steel | 53,133 |
| 9 | coach | steel | 79,362 |
| 3 | coach-lng.-buff. | steel | 89,375 |
| 1 | diner | steel | 104,618 |
| 2 | diner-lng.-obs. | steel | 120,955 |
| 2 | dorm-coach | steel | 85,142 |
| 17 | sleepers-roomette-bedr. | steel | 107,507 |
| 1 | obs.-lng.-sleeper | steel | 114,310 |
| 2 | pass.-bag.-dorm. | stainless steel | 84,541 |
| 3 | dining | stainless steel | 98,076 |
| 3 | tax.-lng.-obs. | stainless steel | 96,936 |
| 1 | pass.-bag. | stainless steel | 96,374 |
| 11 | coach | stainless steel | 76,877 |
| 15 | 62-pass. coach | high tensile steel | 82,500 |

Locomotive Prices

| No. bought | Type | Service | Horsepower or tractive force | Price |
|------------|--------------|-------------|------------------------------|-----------|
| 2 | Diesel-Elec. | Frt. | 4,500-hp. | \$437,331 |
| 2 | Diesel-Elec. | Pass. | 4,500-hp. | 447,252 |
| 2 | Diesel-Elec. | Frt. | 3,000-hp. | 288,166 |
| 2 | Diesel-Elec. | Sw. | 1,000-hp. | 78,500 |
| 7 | Diesel-Elec. | Road | 2,000-hp. | 199,738 |
| 1 | Diesel-Elec. | Road | 2,000-hp. | 199,738 |
| 7 | 2-8-4 | Frt. | ..... | 226,195 |
| 6 | Diesel-Elec. | Sw. | 660-hp. | 59,750 |
| 4 | Diesel-Elec. | Pass. | 2,000-hp. | 183,501 |
| 6 | Diesel-Elec. | A-Unit Frt. | 1,500-hp. | 136,992 |
| 1 | Diesel-Elec. | B-Unit Frt. | 1,500-hp. | 120,785 |
| 11 | Diesel-Elec. | Pass. | 2,000-hp. | 211,000 |
| 1 | Diesel-Elec. | Pass. | 1,000-hp. | 155,000 |
| 8 | Diesel-Elec. | Frt. | 4,500-hp. | 448,000 |
| 20 | Diesel-Elec. | A-Unit Frt. | 1,500-hp. | 120,400 |
| 1 | Diesel-Elec. | B-Unit Frt. | 1,500-hp. | 111,400 |
| 16 | Diesel-Elec. | A-Unit Frt. | 1,500-hp. | 120,400 |
| 7 | Diesel-Elec. | B-Unit Frt. | 1,500-hp. | 111,400 |
| 4 | Diesel-Elec. | Pass-Frt. | 2,000-hp. | 170,000 |
| 13 | Diesel-Elec. | A-Unit Frt. | 1,500-hp. | 137,500 |
| 5 | Diesel-Elec. | Sw. | 1,000-hp. | 89,000 |
| 1 | Diesel-Elec. | Sw. | 1,000-hp. | 98,000 |
| 2 | Diesel-Elec. | Frt. | 3,000-hp. | 292,431 |
| 3 | Diesel-Elec. | Frt. | 1,500-hp. | 146,270 |
| 21 | Diesel-Elec. | Sw. | 1,000-hp. | 89,869 |
| 6 | Diesel-Elec. | Pass. | 4,500-hp. | 457,810 |
| 5 | Diesel-Elec. | Frt. | 6,000-hp. | 574,278 |
| 20 | 4-4-4-4 | Pass. | ..... | 239,000* |
| 25 | 4-4-4-4 | Pass. | ..... | 254,000* |
| 2 | Diesel-Elec. | Sw. | 600-hp. | 59,750 |
| 7 | Diesel-Elec. | Sw. | 600-660-hp. | 60,000 |
| 3 | Diesel-Elec. | Sw. | 1,000-hp. | 79,000 |
| 3 | Diesel-Elec. | A-Unit Road | 4,000-hp. | 402,098 |
| 6 | Diesel-Elec. | Frt. | 6,000-hp. | 588,655 |
| 14 | Diesel-Elec. | Sw. | 1,000-hp. | 89,505 |
| 12 | 4-8-4 | Frt. | ..... | 219,500 |
| 2 | Diesel-Elec. | Road Sw. | 1,500-hp. | 125,000 |
| 2 | Diesel-Elec. | Yard Sw. | 1,000-hp. | 89,000 |
| 2 | Diesel-Elec. | Frt. | 1,350-hp. | 121,634 |
| 28 | Diesel-Elec. | Sw. | 1,000-hp. | 90,200 |
| 9 | Diesel-Elec. | Sw. | 1,000-hp. | 89,220 |
| 6 | Diesel-Elec. | Sw. | 660-hp. | 70,195 |
| 2 | Diesel-Elec. | Sw. | 1,000-hp. | 89,547 |
| 2 | Diesel-Elec. | Sw. | 660-hp. | 69,797 |
| 2 | Diesel-Elec. | Sw. | 1,00-hp. | 90,680 |
| 2 | Diesel-Elec. | Sw. | 600-hp. | 53,895 |
| 10 | Diesel-Elec. | Frt. | 6,000-hp. | 556,800 |
| 2 | Diesel-Elec. | Yard Sw. | 1,000-hp. | 89,500 |

* 45 tenders; 18,000 gal., for these locomotives were priced at \$36,000 each.

Freight Car Prices

| No. of cars | Type | Construction | Capacity | Price |
|-------------|----------------|----------------------|----------|---------|
| 500 | hopper | steel | 50-ton | \$3,471 |
| 900 | auto-box* | steel | 50-ton | 5,085 |
| 1,000 | hopper | steel | 50-ton | 3,170 |
| 1,000 | hopper | steel | 50-ton | 3,264 |
| 500 | auto-box* | steel | 50-ton | 6,190 |
| 100 | pulpwood | steel | 50-ton | 3,350 |
| 200 | cov. hopper | steel | 70-ton | 4,355 |
| 500 | hopper | steel | 50-ton | 2,690 |
| 700 | hopper | steel | 50-ton | 2,843 |
| 790 | hopper | steel | 50-ton | 2,843 |
| 50 | caboose | steel | 30-ton | 6,266 |
| 300 | flat | steel | 50-ton | 3,313 |
| 800 | box | steel | 50-ton | 3,495 |
| 500 | box | steel | 50-ton | 4,182 |
| 400 | gondola | steel | 70-ton | 3,150 |
| 140 | cov. hopper | steel | 70-ton | 5,025 |
| 400 | gondola | steel | 70-ton | 3,188 |
| 50 | auto-box* | steel | 50-ton | 5,100 |
| 50 | auto-box* | steel | 50-ton | 5,600 |
| 50 | cov. hopper | steel | 70-ton | 4,900 |
| 150 | box | steel | 50-ton | 3,800 |
| 500 | hopper | steel | 50-ton | 2,776 |
| 100 | rack | steel | 50-ton | 4,167 |
| 700 | box | steel | 50-ton | 3,465 |
| 200 | gondola | steel | 70-ton | 4,412 |
| 200 | hopper | steel | 50-ton | 2,725 |
| 600 | gondola | steel | 50-ton | 3,086 |
| 150 | cov. hopper | steel | 70-ton | 4,189 |
| 100 | ballast | steel | 70-ton | 4,702 |
| 269 | box | steel | 50-ton | 3,650 |
| 500 | hopper | steel | 50-ton | 3,440 |
| 500 | box | steel | 50-ton | 4,135 |
| 50 | cov. hopper | steel | 70-ton | 4,093 |
| 50 | cov. hopper | steel | 70-ton | 4,962 |
| 500 | box | steel | 50-ton | 3,577 |
| 300 | cov. hopper | steel | 70-ton | 4,285 |
| 100 | cov. hopper | steel | 70-ton | 4,513 |
| 150 | auto-box | steel | 50-ton | 4,822 |
| 50 | auto-parts box | steel | 50-ton | 7,210 |
| 300 | auto-box* | steel | 50-ton | 5,429 |
| 200 | hopper | steel | 70-ton | 4,553 |
| 1,000 | auto-box | steel | 50-ton | 5,075 |
| 300 | twin hopper | copper-bearing steel | 70-ton | 3,913 |
| 100 | twin hopper | high-tensile steel | 70-ton | 4,264 |
| 100 | twin hopper | high-tensile steel | 70-ton | 4,146 |
| 200 | box | steel | 50-ton | 4,299 |
| 600 | hopper | steel | 55-ton | 3,273 |
| 750 | gondola | steel | 50-ton | 2,866 |

* Including loading devices or attachments.

1946 Construction Covered Wide Range

Lifting of war-time restrictions on new work undertaken, and release of materials from priorities, permitted the railways to initiate many badly-needed improvements

By **GEORGE E. BOYD**

Associate Editor

DESPITE all optimistic predictions at the beginning of 1946, and all forecasts for greatly increased activity in railway construction, actual accomplishment fell considerably below expectations as expressed at that time. Yet, in the number and variety of projects and the amount of money expended, railway construction was relatively active, compared with the record for the past 15 years.

Starting under favorable conditions, including the removal of restrictions on the character of the projects approved by the government agencies and in the use of certain materials, prospects were excellent for a high rate of activity in 1946. In considerable part the programs for 1946 included projects that could not be finished during the previous year and that were, of necessity, carried over into the new year. On the other hand, many of them covered additional improvements that were needed sorely, but which had been refused approval earlier for one reason or another. Other projects were of a character that normally would be considered routine requirements to keep the properties abreast of the times, while still others were on a larger scale to put the roads in a better position to compete with other forms of transportation.

Inevitably, every facility for the transportation of persons and goods suffers from a high rate of obsolescence, because the demands of traffic are changing constantly and methods for handling it must keep abreast of these current requirements. As a result, many facilities that are adequate today may be outmoded tomorrow. During the depression years this tendency toward obsolescence in railway facilities was accelerated by reason of the unusual and extensive

Starting 1946 with the brightest prospects in years, railway construction quickly ran into many difficulties, including strikes and consequent uncertainties with respect to essential materials, while failure to obtain increased freight rates until almost the last of the year delayed the starting of much badly-needed construction. However, despite these and other hampering conditions, the roads as a whole did undertake a surprisingly large amount of improvements, covering a wider range than for any year since 1931.

changes that were made in methods of transportation.

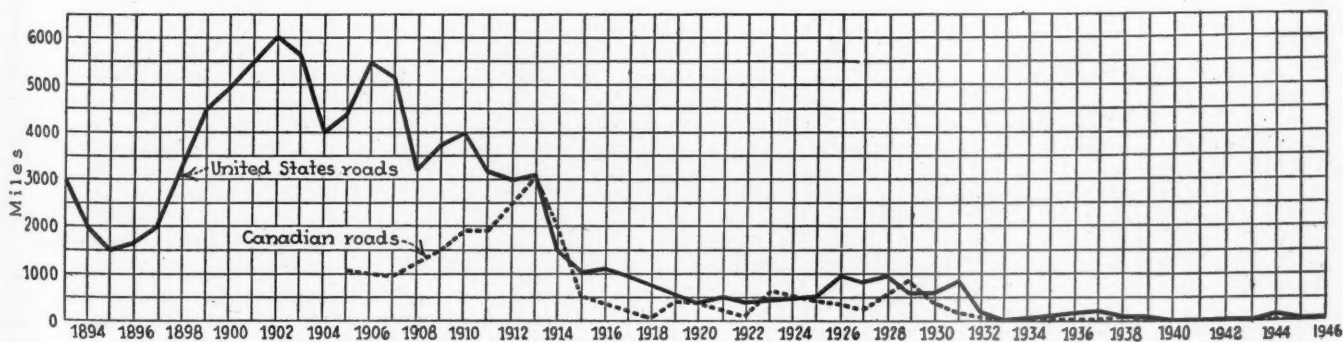
However, because of the almost complete cessation of revision and expansion of these facilities, their condition deteriorated far more rapidly than would have occurred under normal use. These deficiencies were aggravated as traffic increased rapidly under war-time pressure. Yet, although strenuous efforts were made to overcome them during the war years, the surface was but little more than scratched, because the accumulation of needed work had grown to such proportions that traffic remained far ahead of the improvements that could be made in the comparatively short time that was available and the conditions under which they could be carried out.

As a result, while a surprising amount of improvement work was carried to completion, particularly projects that were intended to speed train movements through yards and on the road, the number and scope of other projects that were needed as badly were greatly limited. It should also be kept in mind that practically none of the projects that were permitted to be carried out was in any wise designed to place the roads in position to meet the needs of post-war traffic, but rather the specific needs of the moment.

That the need for such improvements to give the railways a favorable position in competing for post-war traffic was recognized keenly by the railways themselves is shown by the announcement late in 1945 that, based on the assumption that the yearly earnings for the period would equal or exceed those for 1941, they were planning to expend during 1946, 1947 and 1948 approximately \$800,000,000 on improvements to their fixed properties and an equal amount on equipment.

Diversity of New Products

In pursuance of this policy, the programs for 1946 contained such projects as Diesel locomotive shops; revisions of grades and alinement to remove restrictions on speed and tonnage; new installations of centralized traffic control; new engine terminals; enlargement and improvement of existing yards and the construction of new yards; the revision of water facilities and the extension of water treatment; the modernization of existing buildings, including stations, freight houses, shops and other facilities; the renewal of bridges; the construction

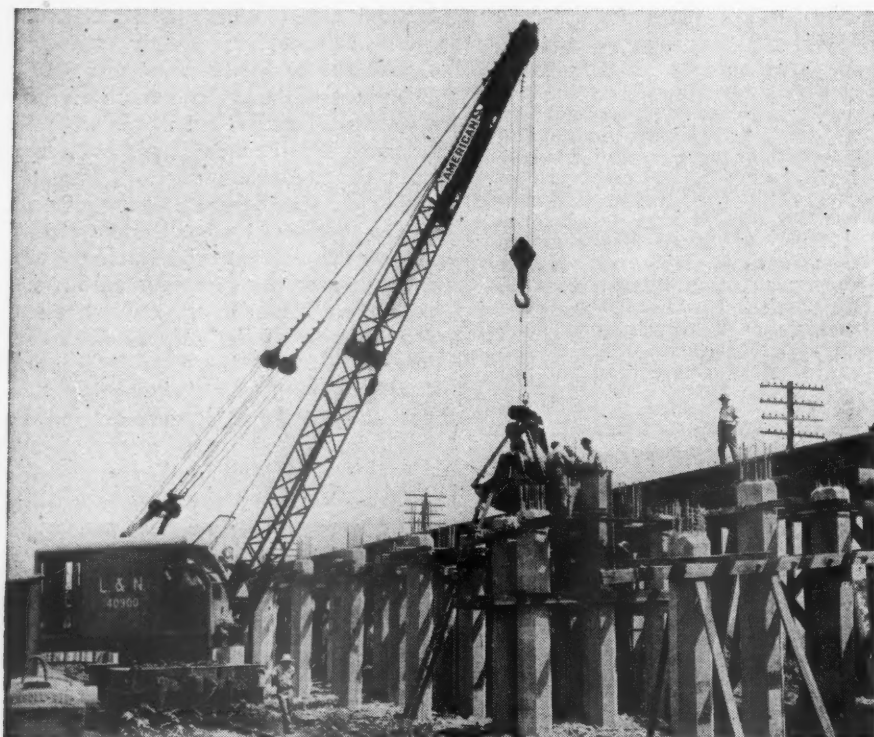
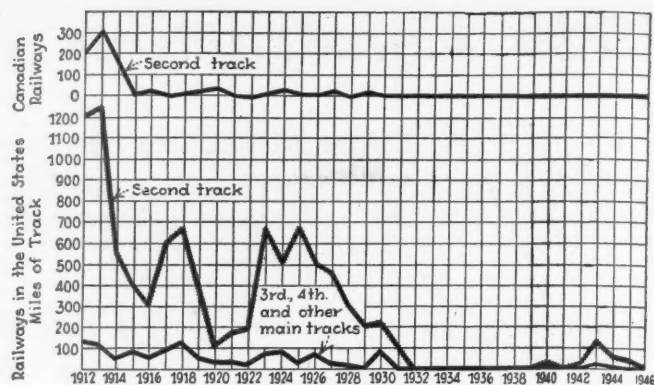


Mileage of new lines constructed in the United States and Canada

of new lines to reach untapped natural resources; and a wide variety of other work, including the widening of cuts, the strengthening of embankments, the smoothing of the right of way and the installation of drainage.

Although conditions appeared to be favorable for carrying out such programs on a large scale, the year had scarcely opened before strikes for higher wages and other advantages were undertaken in many industrial fields, some of which lasted for months, thus stopping the flow of essential materials to construction projects, as well as reducing freight traffic below the level of any of the war years.

Mileage of multiple tracks constructed



Above—The construction by the Louisville & Nashville of a long reinforced concrete pile-and-slab trestle approach to its Henderson Bridge across the Ohio river, to replace a timber structure, was one of the larger bridge projects on which work went forward in 1946. Below—Among the important line changes completed during 1946 was the Hancock Hill project of the St. Louis-San Francisco



In addition, the Interstate Commerce Commission delayed acting upon the railways' request for permission to raise freight rates to the point that even financial safety demanded. Furthermore, at one time during the year the railways themselves were confronted with a two-day nation-wide strike, which, if it had been prolonged, would have stopped every improvement activity in which they were engaged.

Miles of New Lines Completed in Canada Since 1904

| Year | Miles | Year | Miles |
|------|-------|------|-------|
| 1904 | 316 | 1925 | 414 |
| 1905 | 1,181 | 1926 | 335 |
| 1906 | 1,007 | 1927 | 310 |
| 1907 | 976 | 1928 | 723 |
| 1908 | 1,249 | 1929 | 841 |
| 1909 | 1,488 | 1930 | 385 |
| 1910 | 1,844 | 1931 | 250 |
| 1911 | 1,898 | 1932 | 121 |
| 1912 | 2,232 | 1933 | 0 |
| 1913 | 3,013 | 1934 | 1 |
| 1914 | 1,978 | 1935 | 2 |
| 1915 | 718 | 1936 | 1 |
| 1916 | 290 | 1937 | 0 |
| 1917 | 207 | 1938 | 101 |
| 1918 | 135 | 1939 | 1 |
| 1919 | 433 | 1940 | 2 |
| 1920 | 305 | 1941 | 1 |
| 1921 | 252 | 1942 | 1 |
| 1922 | 145 | 1943 | 3 |
| 1923 | 655 | 1944 | 0 |
| 1924 | 615 | 1945 | 15 |
| | | 1946 | 0 |

Faced with this widespread industrial unrest, along with an extreme shortage of some of the materials essential to the completion of their plans, and hampered by falling revenues, it is surprising that as many and as important projects were carried to completion or initiated during the year. It took courage to face the immediate difficulties and a high order of optimism and belief in the future prosperity of the country and its transportation requirements to carry out the level of construction that was attained, despite all of the difficulties that arose. It gives encouragement to those who believe that the railways have a future and who also believe that their overall program of improvements has only been delayed, and not abandoned.

Grade Separations Resumed

In 1943 most of the grade-separation projects then under way were completed. However, a few were carried over into the following year, while others that re-

Miles of Main Track Built in the United States in 1946

| State | Number of companies building | First track | Second track | Third track | Fourth track | Total |
|---------------|------------------------------|-------------|--------------|-------------|--------------|-------|
| Arizona | 1 | 0.52 | | | | 0.52 |
| California | 1 | 3.08 | | | | 3.08 |
| Florida | 2 | 5.74 | | | | 5.74 |
| Iowa | 1 | 34.53 | | | | 34.53 |
| Kentucky | 1 | 19.00 | | | | 19.00 |
| Missouri | 1 | | 3.14 | | | 3.14 |
| North Dakota | 1 | | 1.67 | | | 1.67 |
| Ohio | 1 | | | 8.97 | | 8.97 |
| Oklahoma | 1 | 0.15 | | | | 0.15 |
| Oregon | 1 | 0.17 | | | | 0.17 |
| West Virginia | 1 | 4.77 | | | | 4.77 |
| Totals | | 67.96 | 4.81 | 8.97 | | 81.74 |

quired scarce materials were suspended until these materials again became available. As a result of this situation, as well as failure of federal appropriations during those years, grade-separation activities became almost negligible in both 1944 and 1945. While there was no large resumption of this type of work in 1946, there was a noticeable revival of these projects during the year.

No important new lines were completed or under way during the year; in fact, the largest single project was a line revision on which a little more than 35 miles were completed during the year. Compared with the previous year, the new-line mileage placed in operation was

substantially the same, 68 miles, compared with 65 in 1945. However, several new-line projects are under way or under survey, principally to reach new resources or in connection with line and grade revisions.

During the 20-year period ending with 1926, the mileage of new lines completed annually varied from 5,212 in 1907 to 314 in 1922. The latter mileage was the smallest recorded for any year since 1847, when the long period of railway expansion was beginning to get under way. In contrast, during the following two decades, to and including 1946, the largest mileage completed in any year was in 1928, when 1,025 miles were placed in operation; while the smallest was the 24 miles completed in 1933, during the depth of the depression, which is the least new mileage recorded for any year since the first railway was constructed in 1830.

The aggregate mileage completed during the first period cited was 35,147, or a yearly average of 1,757 miles, while the total mileage for the 20-year period ending with 1946 was only 4,840, or an annual average of only 242—little more than one-seventh the earlier average.

Second-track construction dropped from 43 miles in 1945 to slightly less than five miles in 1946. On the other hand, no third track was completed in 1945, while nine miles were placed in operation in 1946.

In Canada, new-line mileage was negligible, being only a small fraction of a mile, and no new multiple track was placed in operation during the year.

Bridge Renewals High

Like almost every other item of the fixed property, bridges were neglected quite generally during the period of the depression. While several important bridges were replaced and others were strengthened during the war years as a matter of urgent necessity, bridges in general continued to deteriorate to a considerable extent, primarily because of the difficulty of obtaining structural steel, and most heavy bridge work was deferred unless the structures involved were approaching an unsafe condition. As a result, the close of the war found the railways saddled with an abnormally high accumulation of deferred bridge

maintenance and renewals. Because of this situation, bridge work became one of the major activities of the construction programs for the year, with 14 renewal jobs ranging between \$500,000 and \$1,000,000, and five that were well over \$1,000,000. The roads of the United States and Canada reported 75 such jobs completed during the year, or still under way at its close, that required an expenditure of \$100,000 or more individually, and which aggregate almost \$27,000,000.

Likewise, line and grade revisions had a large place in the programs for the year, 41 such projects, costing \$100,000 or more individually, being completed or still under way at the close of the year, at an aggregate cost of slightly more than \$26,000,000. At the same time, several other important projects were either under survey or in contemplation. One of the foregoing projects under way, to cost approximately three million dollars when completed, involves a major grade revision, but is being undertaken primarily to raise the track above any probable high water. The remainder are conventional revisions of line and grade to permit higher speeds or greater tonnage, or both.

Other Improvements

Yard and terminal improvements, of no less importance than those already mentioned, also occupied a large place in the programs for the year. No less than 33 such projects, costing from \$500,000 to approximately \$6,000,000 each, were either completed during the year or under way at its close. These improvements, which ranged from extensive rearrangements and extensions of existing yards to entirely new yards, combined with similar improvements of smaller magnitude, represent an eventual cost of approximately \$40,000,000.

Continuing the policy of making improvements that are designed to facilitate the movement of trains on the road, there were numerous installations and rearrangements of signals, and particularly installations of centralized traffic control.

Most of the latter also required the relocation and extension of passing sidings and, in some cases, extensive installations of crossovers or the rearrangement of such track layouts.

As has been mentioned, while some 1945 projects, undertaken as war-time measures specifically to speed traffic, were carried over into 1946, many new projects were started or planned during the year, and covered a far wider range of improvements than was in evidence for the last 15 years, when construction has been held to the most essential requirements. It must be kept in mind that while the accompanying list includes those projects that are of special interest

Miles of New Lines Completed in the United States Since 1830

| Year | Miles | Year | Miles |
|------|--------|------|-------|
| 1830 | 40 | 1888 | 7,066 |
| 1831 | 99 | 1889 | 5,707 |
| 1832 | 191 | 1890 | 5,739 |
| 1833 | 116 | 1891 | 4,620 |
| 1834 | 214 | 1892 | 4,648 |
| 1835 | 138 | 1893 | 3,024 |
| 1836 | 280 | 1894 | 1,760 |
| 1837 | 348 | 1895 | 1,420 |
| 1838 | 453 | 1896 | 1,692 |
| 1839 | 386 | 1897 | 2,109 |
| 1840 | 491 | 1898 | 3,265 |
| 1841 | 606 | 1899 | 4,569 |
| 1842 | 505 | 1900 | 4,894 |
| 1843 | 288 | 1901 | 5,368 |
| 1844 | 180 | 1902 | 6,026 |
| 1845 | 277 | 1903 | 5,652 |
| 1846 | 333 | 1904 | 3,832 |
| 1847 | 263 | 1905 | 4,388 |
| 1848 | 1,056 | 1906 | 5,623 |
| 1849 | 1,048 | 1907 | 5,212 |
| 1850 | 1,261 | 1908 | 3,214 |
| 1851 | 1,274 | 1909 | 3,748 |
| 1852 | 2,288 | 1910 | 4,122 |
| 1853 | 2,170 | 1911 | 3,066 |
| 1854 | 3,442 | 1912 | 2,997 |
| 1855 | 2,453 | 1913 | 3,071 |
| 1856 | 1,471 | 1914 | 1,532 |
| 1857 | 2,077 | 1915 | 933 |
| 1858 | 1,966 | 1916 | 1,098 |
| 1859 | 1,707 | 1917 | 979 |
| 1860 | 1,500 | 1918 | 721 |
| 1861 | 1,016 | 1919 | 686 |
| 1862 | 720 | 1920 | 314 |
| 1863 | 574 | 1921 | 475 |
| 1864 | 947 | 1922 | 324 |
| 1865 | 819 | 1923 | 427 |
| 1866 | 1,404 | 1924 | 579 |
| 1867 | 2,541 | 1925 | 644 |
| 1868 | 2,468 | 1926 | 1,005 |
| 1869 | 4,103 | 1927 | 779 |
| 1870 | 5,658 | 1928 | 1,025 |
| 1871 | 6,660 | 1929 | 666 |
| 1872 | 7,439 | 1930 | 513 |
| 1873 | 5,217 | 1931 | 748 |
| 1874 | 2,584 | 1932 | 163 |
| 1875 | 1,606 | 1933 | 24 |
| 1876 | 2,575 | 1934 | 76 |
| 1877 | 2,280 | 1935 | 45 |
| 1878 | 2,428 | 1936 | 93 |
| 1879 | 5,006 | 1937 | 148 |
| 1880 | 6,876 | 1938 | 38 |
| 1881 | 9,789 | 1939 | 58 |
| 1882 | 11,599 | 1940 | 26 |
| 1883 | 6,819 | 1941 | 54 |
| 1884 | 3,974 | 1942 | 74 |
| 1885 | 3,131 | 1943 | 56 |
| 1886 | 8,400 | 1944 | 121 |
| 1887 | 13,081 | 1945 | 65 |
| | | 1946 | 68 |

because of their magnitude and cost, a multitude of jobs of smaller magnitude and less cost individually were being carried on simultaneously.

Many factors will affect the scope and magnitude of improvements to the fixed properties in the year immediately ahead, but the recent increase in freight rates allowed the roads should make it easier for them to finance a number of larger

projects, and thus still further broaden the scope of the work that can be undertaken.

Following is a detailed report by roads of all grade-crossing work undertaken, and of all other construction projects completed during the year, or still in progress at its close, the individual cost of which approached or exceeded \$100,000:

Railway Construction in the United States

(Figures in parentheses indicate percentage of completion at the end of 1946)

Alaska

Important Work Undertaken: Widening bank, ditching, and construction of culverts, Mile Post 372 to 385, \$128,900 (100). Widening banks, ditching, and construction of culverts, Mile Post 284 to 347, \$330,916 (15). Replacement of bridge No. 266.7 with 200-ft. steel through truss, \$103,325 (100). Relocation of bridge No. 288.7 with a 150-ft. steel through truss, \$100,000 (100). Construction of new water supply system and pump plant, Anchorage yard, \$107,000 (75).

Alton

Important Work Undertaken: Construction of shops for servicing Diesel locomotives, St. Louis, Mo., \$300,000 (95). Construction of commissary and storeroom, St. Louis, Mo., \$235,000 (90). Construction of coach yard, California avenue, Chicago, \$400,000 (70). Construction of freight house for freight forwarding company, California avenue, Chicago, \$180,000 (40).

Atchison, Topeka & Santa Fe

Grade Crossing Eliminations: Overcrossings: Replace timber trestle, raise steel span and re-new highway deck, Edelstein, Ill. (95). State highway, Henrietta, Mo. (15).

Important Work Undertaken: Rip rap embankment at Great Salt Plains dam near Cherokee, Okla. (100). Renew approaches and replace piers, bridge 368-B west to Dean Lake, Mo. (100). Raise grade and renew bridge, east of Quenemo, Kan. (100). Revision of alignment to reduce curvature, Ancona, Ill. (50). Bridge renewal and line change, Bosworth, Mo. (100). Installation of C.T.C., including necessary track changes, Ellinor-El Dorado, Kan. (100). Renew bridge, Hibbard, Ariz. (100). Renew bridges west of Rivera, Cal. (100). Extension of passing siding, Mormon-Stockton, Cal. (100). Spur connection at Long Beach, Los Angeles, Cal. (100). Relocate segment of main tracks, Querino, Ariz. (50). Relocate segments of main track, Ponto, Cal. (100). Remote control switches, Ash Fork, Ariz. (100). Freight house and auto dock, Los Angeles, Cal. (100). New fueling facilities, Gallup, N. M. (100). New Diesel repair facilities, San Bernardino, Cal. (100). Installation of C.T.C., including necessary track changes, Waynoka, Okla., to Texas-Oklahoma state line (100). Installation of C.T.C., including necessary track changes, Belva, Okla., to Quinlan (100). Extension of enginehouse, Belen, N. M. (100). Relocate segment of main track, Heman, Okla., to Belva (100).

(Gulf, Colorado & Santa Fe) **Important Work Undertaken:** Relocate segment of main track, east of Wynnewood, Okla. (40).

(Panhandle & Santa Fe) **Important Work Undertaken:** Installation of C.T.C., including necessary track changes, Canadian, Tex., to Pampa (50).

Atlantic Coast Line

First Track: 2.02 miles, Tarpon Springs, Fla. **New Road Under Construction:** Branch line to Victor Chemical Company plant, Tarpon Springs, Fla., \$160,300 (100).

Grade Crossing Elimination: Subway: Palmetto street, Florence, S. C., \$200,000 (100).

Important Work Undertaken: Replacement of open-deck wooden trestle with concrete slabs, 2,093 ft., over Roanoke river, Norfolk, N. C., \$330,800 (100). Replacement of shop facilities, Montgomery, Ala., \$183,000 (100). Replacing freight station, Waycross, Ga., \$176,000 (40). New Diesel shop facilities, Jacksonville, Fla., \$265,900 (100).

Baltimore & Ohio

Grade Crossing Elimination: Overcrossing: Grant City to Bay Terrace, Staten Island, N. Y., joint with state, \$3,800,000 (20).

Important Work Undertaken: Rehabilitation of Pier 5, St. George, N. Y., \$213,000 (100). Additional yard facilities, Wilamere, Del., \$590,000 (100). Construction of power plant, Grafton, W. Va., \$203,000 (100). Installation of track

scale and other yard facilities, Cowen, W. Va., \$125,000 (100). Revision of alignment, Willow Creek, Ind., \$119,000 (60). Construction of spur track, Cumberland, Ohio, \$308,000 (100). Additional yard facilities, Hamilton, Ohio, \$625,000 (100). Construction of spur track, Muddlety, W. Va., \$187,000 (100). Additional facilities at 26th street yard, N. Y., \$400,000 (100). Improvements to Pier 24, Philadelphia, Pa., \$257,000 (100). Construction of passenger station, Silver Spring, Md., \$157,000 (100). Renewal of water main and sprinkler system on piers, Locust Point, Md., \$175,000 (100). Construction of facilities for servicing Diesel locomotives, Lincoln coach yard, Chicago, \$95,000 (100). Construction of freight house, Chicago, \$134,800 (100). Improvements to 41 bridges, \$1,700,000 (100). Construction of additional yards and engine servicing facilities, East St. Louis, Ill., \$2,231,000 (95). Improvements on K street, Washington, D. C., \$470,000 (85).

Construction of locomotive servicing facilities, Garrett, Ind., \$110,000 (85). Additional tracks and structures, Barr yard, Chicago, \$1,856,000 (70). Construction of locomotive and car servicing facilities, Barr yard, Chicago, \$563,000 (20). Reconstruction of bridge, Point Pleasant, W. Va., \$1,890,000 (60). Construction of coal-handling facilities, Lorain, Ohio, \$3,700,000 (50). Relocation of track account of construction of Dillon dam, Newark, Ohio, to Zanesville, \$6,125,000 (30). Improvements to piers, Locust Point, Md., \$179,000 (15). Improvements on Eastern Ohio branch, Cumberland, Ohio, \$122,000 (50). Improvements to 20 bridges, \$600,000 (40).

Belt Railway of Chicago

Grade Crossing Eliminations: Subway: Under three tracks, Kenton avenue and 47th street, Chicago, \$400,000 (70).

Bessemer & Lake Erie

Grade Crossing Elimination: Relocation of highway crossing seven tracks, to eliminate grade crossing, Calvin, Pa., \$8,400 (100).

Boston & Maine

Grade Crossing Eliminations: Overcrossing: New Boston road, Templeton, Mass., \$110,000 (100).

Crossing eliminated by change in highway, South Danbury road, Danbury, N. H., \$100 (100). Crossing eliminated by closing street, Glen avenue, Troy, N. Y., \$100 (100). Crossing eliminated by closing street, Brick Yard crossing, Templeton, Mass., \$100 (100).

Important Work Undertaken: New interlocking, installation of C.T.C., automatic signal changes including longer crossovers and other incidental track changes, East Portal, Mass., to Hoosick Junction, N. Y., \$500,000 (100). Installation of block signals, interlocking and C.T.C., together with incidental track changes, Lowell Junction, Mass., to Willows, \$1,000,000 (15).

Canadian National in the United States

Grade Crossing Eliminations: Reconstruction of overcrossing, West Long Lake road, Orchard Lake, Mich. (100).

Important Work Undertaken: Construction of new dock and additional track facilities, Flint, Mich. (100).

Canton

Important Work Undertaken: Reconstruction of 1,396 ft. of bulkhead at Piers 6 and 10, including necessary dredging, Canton, Baltimore, Md., \$301,411 (100).

Central of Georgia

Grade Crossing Eliminations: Overcrossings: Screven county, Dover, Ga.; built by state with federal funds, \$30,000 (50). Wilkinson county, Gordon, Ga.; built by state with federal funds, \$50,000 (15).

Important Work Undertaken: Construction of industrial track, Macon, Ga., \$146,520 (75).

Central of New Jersey

Grade Crossing Eliminations: Myrtle avenue, Oceanport Boro., N. J., vacated by Boro.; 16 grade crossings eliminated when the North Long Branch was abandoned.

Chesapeake & Ohio

First Track: From Brushy Junction, W. Va., to Leivasy Junction, 4.77 miles.

New Road Under Construction: Extension of Mead Fork from Jenkins, Ky., to Pound, Va., 14.50 miles.

Grade Crossing Eliminations: Overcrossing: Dock, W. Va., (70). Widen underpass, replacing timber trestle with steel span, Ivyton, Ky. (100).

Important Work Undertaken: Construction of eight cinder block warehouses and installation of sprinkler system, Newport News, Va., \$446,000 (99). Construction of 16 cinder block warehouses and installation of sprinkler system, Morrison, Va., \$638,500 (99). Revision of alignment, Keswick, Va., \$167,300 (70). Reconstruction of bridge 1700-A, Snowden, Va., \$205,900 (started). Modernize passenger station, extend and rearrange yard tracks, telegraph and telephone and other facilities, Charlottesville, Va., \$518,000 (22). Revision of alignment between Millboro and Lick Run tunnels and at Thorny Run, \$208,910 (10); revision of alignment, North Mountain, Va., to Augusta Springs, \$824,300 (5); revision of alignment, Craigsville, Va., \$191,400 (5); revision of alignment, Griffith, Va., \$392,800 (5); revision of alignment, Longdale, Va., \$179,500 (5); revision of alignment, including the conversion of Masons tunnel into an open cut, Millboro, Va., \$160,450 (75). Installation of double switching lead, Clifton Forge, Va., \$285,000 (78). Revision of alignment, including construction of new tunnel, Fort Spring, W. Va., \$2,254,500 (35). Installation of C.T.C., Sewell, W. Va. to MacDougal, including the rearrangement of tracks and an addition to signal tower, \$289,950 (84). Tracks to serve coal-washing plant and river terminal, Ceredo, W. Va., \$1,046,300 (65). Tracks to serve coal mine, Emmett, W. Va., \$237,265 (3). Tracks to serve coal mine development, including bridge over the Guyandot river at Rita, W. Va., \$347,000 (3). Reconstruction of bridge 5129 over Big Sandy river, including the encasement of six piers, Big Sandy Junction, Ky., \$1,351,000 (89). Extension of old passing siding and construction of new passing sidings and water station, installation of C.T.C., Big Sandy Junction, Ky., to Beaver Junction, and from Beaver Junction to Martin, and automatic color-light signals, Beaver Junction to Elkhorn City, Big Sandy subdivision, including necessary track changes, \$1,213,762 (86). Installation of C.T.C. signals, including necessary track changes, Aden, Ky., to Olive Hill, \$134,000 (2). Replacement of frame coaling station with concrete structure, including relocation of water tank and water column, Paintsville, Ky., \$193,500 (37). Extension of shop building, including installation of shop machinery and equipment, Russell, Ky., \$834,000 (1). Yard and terminal improvements, Shelby, Ky., \$1,192,000 (1.5). Three-hundred ton concrete coaling station, Martin, Ky., \$109,500 (42). Spur and sidings to serve two coal mine developments, Gearheart, Ky., and Buckingham, \$371,000 (22).

Extension of tracks in Yards One and Four, Stevens, Ky., \$251,425 (96). Construction of coaling and watering facilities, G. B. Cabin, Ohio, \$279,400 (98). Replacement of Bridge 635, including line revision, Richmond, Ind., \$190,000 (65). Automatic sprinklers, fire curtains, etc., under the decks of five piers, Newport News, Va., \$195,300 (100). Revision of alignment, Peake, Va., to Hanover, \$419,900 (100). Revision of alignment, Mechums river, Va., \$117,700 (100). Revision of alignment, Panther Gap, Va., \$254,300 (100). Installation of C.T.C., including necessary track changes, Staunton, Va., to Clifton Forge, \$379,800 (100). Fifty-ton coaling stations at Clifton Forge, Va., and Hinton, W. Va., \$146,400 (100). Replacement of stone arch bridge over Rivanna river, including revision of alignment, Columbia, Va., \$358,692 (100). Installation of C.T.C. signals, including necessary track changes, Strathmore, Va., to Greenway, \$278,675 (100). Construction of tracks to serve ballast quarry, Greenlee, Va., \$101,000 (100). Installation of C.T.C., including necessary track changes, Orange, Va., to Charlottesville, \$187,900 (100).

Replacement of coaling station, rearrangement of tracks and electrification of water station, West Hamlin, W. Va., \$171,500 (100). Extension of five tracks in eastbound yard and construction of new switching lead, Hinton, W. Va., \$608,200 (100). Tracks to serve coal mine development, Sarita, W. Va., \$113,600 (100). Tracks to serve coal mine development, Stollings, W. Va., \$267,600 (100). Tracks to serve coal mine development, Kayford, W. Va., \$120,450 (100). Construction of spur to serve mine development, Fardee, W. Va., \$508,000 (100). Revision of grade, Russell, Ky., \$123,600 (100). Construction of spur to serve mine development, MacDowell, Ky., \$158,000 (100). Construction of spur to serve mine development, Elkhorn City, Ky., \$993,000 (100). Construction of spur to

serve mine development, Nigh, Ky., \$475,200 (100).

Extension of passing sidings, relocation of station buildings and construction of a new telegraph office and manual block signals, Merrillville, Ind., \$105,675 (100). Installation of switch mechanisms, including facing-point locks and center lever locking on main track crossovers in automatic block territory at various points on system, \$137,800 (100). Revision of alignment Goshen, Va., \$214,374 (90).

Chicago & Eastern Illinois

Important Work Undertaken: Installation of C.T.C., Clinton, Ind., to Evansville, including extension of 14 passing sidings and other incidental track changes, \$753,676 (60). Replacing present boilers in power plant, installing coal and ash-handling equipment and an additional generator, Danville, Ill., \$232,000 (58).

Chicago & North Western

Important Work Undertaken: Reconstruction of double track railway bridge No. 185 with four I-beam spans on concrete pile sub-structure, six miles east of Cedar Rapids, Iowa, \$137,000 (100). Raise grade of tracks 2 to 3 ft.; fill scoured-out holes and pave stream beds under three bridges, vicinity of Salt Creek crossing west of Belle Plaine, Iowa, \$136,000 (65). Construction of concrete caisson foundation for highway and electric railway bridge over Chicago & North Western tracks, Kinzie street, Chicago, \$160,000 (100). Construction of a series of nine deflection dykes totaling 6,500 lin. ft., Missouri river bank protection, east of Pierre, S. D., \$277,500 (100). Raise grade 3 to 5 ft. over distance of 2.1 miles; raise and extend various bridges and construct new waterway openings, Logan, Iowa, to Missouri Valley, \$149,000 (100). Construction of 350-ton concrete coaling plant and locomotive washing rack, Council Bluffs, Iowa, \$128,000 (100).

Construction of addition to enginehouse, including concrete drop pit, motor hoist and table tops, heating, plumbing, lighting and power systems, Chicago avenue, Chicago, \$162,000 (20). Extension of yard tracks in West yard, Clinton, Iowa, \$198,990 (100). Reconstruction of two-span bridge No. 876, and raise grade of track 2 ft., Dennison, Iowa, \$284,930 (40). Reconstruction of single-span bridge No. 886 with two I-beam spans and one through riveted truss span, Arion, Iowa, \$234,890 (5). Reconstruction of two-span through plate-girder bridge No. 913 with two I-beam spans and one through riveted truss span, and raise grade of track 1 ft., Dunlap, Iowa, \$235,350 (10). Installation of C.T.C., including necessary track changes on 74 miles of double track, West Chicago, Ill., to Nelson, \$1,590,265 (2).

Chicago & Western Indiana

Important Work Undertaken: Replacement of present turntable with new turntable 115 ft. long, lengthening three stalls in enginehouse, replacement of present coach yard turntable with present enginehouse turntable, 49th Street Engine Terminal and 51st Street coach yard, Chicago, \$116,225 (100). Construction of mezzanine waiting rooms, improvements in present waiting rooms, concourse and ticket office, Dearborn station, \$653,000 (72).

Chicago, Burlington & Quincy

Grade Crossing Eliminations: Ranchester, Wyo., \$150,000 (10).

Important Work Undertaken: Construction of mechanical car washer, Chicago, \$100,701 (100). Replacement of station and freight house, Rockford, Ill., \$114,168 (100). Revision of main track alignment, Burke, Ill., \$212,141 (75). Construction of barge dock line, Lewistown, Ill., to Illinois river, \$651,935 (30). Raising grade of tracks and raising Bridge 129.93, White Rock, Mo., to Riverland, \$282,688 (85). Revision of alignment, construction of new yard, W. Quincy, Mo., \$938,702 (15). Extension of passing sidings, Lincoln, Neb., to Akron, Colo., \$334,393 (100). Installation of C.T.C., including necessary track changes, Hastings, Neb., to McCook, \$628,000 (100). Rearrangement of 31st street yard, Denver, Colo., \$504,357 (100). Realignment of main tracks and changes in yard, including construction of new coaling facilities, North La Crosse, Wis., \$535,107 (100). Construction of shop for making heavy repairs to Diesel locomotives, W. Burlington, Iowa, \$469,142 (100). Extension of second main track, No. 20 crossovers, Herrington Junction, Wis., \$105,785 (100). Installation of C.T.C., including necessary track changes, Flag Center, Ill., to Savannah, \$352,975 (100). Extension of passing sidings, Bristol, Ill., to Kewanee, \$111,175 (100). Construction of elevator and mechanical grain car dump, Murray, Mo., \$248,862 (100). Installation of C.T.C., including necessary track changes, McCook, Neb., to Akron, Colo., \$382,428 (100). Construction of 23rd street powerhouse, Denver, Colo., \$300,543 (100). Revision of alignment, Greenwood, Neb., \$142,493 (50). Revision of alignment, Callao, Mo., \$260,072 (100). Rebuild bridge, Farley, Mo., \$700,000 (80). (Colorado & Southern) Rearrangement and enlargement of Seventh street freight terminal, Denver, Colo., \$635,725 (100).

Chicago Great Western

Grade Crossing Eliminations: Overcrossings: State Route 386 near Dubuque, Ia., \$30,338 (100). Subway United States Route 30 relocated south of Marshalltown, Ia., \$49,436 (100).

Chicago, Milwaukee, St. Paul & Pacific

Grade Crossing Eliminations: Overcrossings: Techny, Ill., \$120,000 (50). Madison, Wis., \$110,000 (50).

Important Work Undertaken: Elimination of eastbound hump to convert eastbound yard to flat yard, including extension of track and yard facilities, Bensenville, Ill., \$425,000 (80). Addition of seven tracks westbound yard, Bensenville, Ill., \$140,000 (100). Revision of alignment to reduce curvature and gradient, Glenham, S. D., to Selby, \$650,000 (90). Revision of alignment to reduce curvature, Java Junction, S. D., to Gretna, \$280,000 (100). Construction of new mine spur, Odon, Ind., \$215,000 (100). Remodel west approach to drawspan of bridge over Menominee river, Milwaukee, Wis., \$148,000 (90). Replacement of bridge over power canal, rearrangement of tracks, relocation of station and raise grade of tracks, Ottumwa, Iowa, \$166,000 (100). Replacement of wood deck with composite concrete and treated timber deck on 1,160-ft. viaduct over yard, Savannah, Ill., \$245,000 (100). Construction of additional tracks and 1,880 ft. of retaining wall, Chestnut Street line, Milwaukee, Wis., \$274,000 (40). New freight house, 50 by 320 ft., concrete and steel construction, Chicago, \$175,000 (100). New freight house, 60 by 600 ft. masonry and steel construction, Chicago, \$400,000 (10). New shop buildings, including track changes, Milwaukee, Wis., \$1,457,000 (68). Addition to Diesel service shop, Western avenue, Chicago, \$226,430 (25). Installation of two oil burning boilers complete with foundations in powerhouse, Minneapolis, Minn., \$200,000 (100).

Chicago, Rock Island & Pacific

First Track: Floris, Iowa, to Centerville, 34.53 miles.

New Road Under Construction: Ainsworth, Iowa, to Brighton, 17.21 miles (both in connection with line revisions).

Grade Crossing Eliminations: Overcrossings: In connection with bridge over Illinois river, Peoria, Ill.; portion over railway, \$40,000 (60). Roosevelt road, Little Rock, Ark., \$70,000 (65). United States Highways 81 and 66, El Reno, Okla., \$201,000 (90).

Important Work Undertaken: Extension and modernization of shops 47th to 51st streets, Chicago, \$1,700,000 (100). Remodel existing masonry and erect eight 200-ft. through riveted truss spans, replacing pin-connected spans over Red river, Terral, Okla., \$109,419 (100).

Clarendon & Pittsford

Grade Crossing Eliminations: Elimination of overhead crossing by retirement of track, Center Rutland, Vt., cost negligible (100).

Clinchfield

Important Work Undertaken: Construction of new branch to serve coal mine, including grading, bridges and a 2,200-ft. tunnel, Fremont, Va., \$2,000,000 (75).

Delaware & Hudson

Important Work Undertaken: Locomotive coaling and sanding plant, Oneonta, N. Y., \$167,000 (100).

Denver & Rio Grande Western

Important Work Undertaken: Repair and rehabilitation of 68 company cottages, Helper, Utah, and Soldier Summit, \$306,000 (90). New shop and garage for Rio Grande Motorway, Salt Lake City, Utah, \$175,000 (95). Installation absolute block signals, including necessary track changes, South Denver, Colo., to Bragdon, \$324,000 (45).

Denver & Salt Lake

Important Work Undertaken: Line three tunnels with concrete, replacing wood lining, at the following locations: tunnel No. 14, Mile Post 28.28; tunnel No. 15, Mile Post 28.46, and tunnel No. 35, Mile Post 108.64, \$117,000 (100).

Erie

Grade Crossing Eliminations: Reconstruction of overcrossing State Route No. 4, Warren Point, N. J., (45). Reconstruction of overhead crossing H-39.69 Southfields, N. Y. (85). Reconstruction of overcrossing, Wooster road, Barberton, Ohio (100).

Important Work Undertaken: New passenger station, including rearrangement of tracks, Akron, Ohio, (35).

Florida East Coast

New Road Under Construction: Okeechobee branch, Fort Pierce, Fla., to Utopia, 29.3 miles, including passing sidings, connecting and interchange tracks and automatic interlocking, \$1,250,000 (95).

New Road Under Survey: South Bay Fla., Okeelanta, 12 miles.

Great Northern

Grade Crossing Eliminations: Overcrossings: Seventh street, Minneapolis, Minn., \$9,900 (started). Highway bridge, Great Falls, Mont., \$1,905 (started). Highway bridge, Scenic, Wash., \$23,985 (started). State Highway bridge, Northport, Wash., \$27,500 (started). Subways: State Highway, Malta, Mont., \$87,090 (started). State Highway, Brewster, Wash., \$5,020 (started). Reconstruction of Existing Grade Crossing Structures: Repairs to overcrossing, Como avenue, St. Paul, Minn., \$38,000 (started). Replace overcrossing, Nelson, Minn., \$8,500 (started). Repairs to overcrossing, Seventh street, Minneapolis, Minn., \$37,500 (10). Replace overcrossings, Melby, Minn., and Dalton, \$6,400 (started). Repairs to overcrossings, Minneapolis, Minn., and Hopkins and Wayzata, \$26,300 (started). Repairs to overcrossing Bridge 12.8, Minneapolis, Minn., \$7,900 (started). Repairs to overcrossing, Lafayette avenue, St. Paul, Minn., \$27,500 (started). Repairs to overcrossing, Raymond avenue, St. Paul, Minn., \$21,200 (started). Repairs to overcrossing, Seventh street, St. Paul, Minn., \$600 (started). Repairs on overcrossing, Emmert, Minn., \$1,807 (started). Repairs to overcrossing, Bonners Ferry, Idaho, \$540 (started). Replacement of overcrossing, Delta, Wash., cost unknown (started). Repairs to overcrossings at Broadway and Lombard avenues, Everett, Wash., \$6,300 (started). Replacement pedestrian overcrossing, 24th avenue, West Seattle, Wash., \$5,600 (started). Construction pedestrian subway, Willmar, Minn., \$2,750 (started).

Important Work Undertaken: Service and office building at ore dock, Allouez, Wis., \$116,000 (started). General repairs to ore dock, Allouez, Wis., \$463,450 (started). New grain storage elevator, Allouez, Wis., \$1,502,000 (90). Installation of automatic block signals and extension of passing sidings, Lyndale, Minn., to St. Cloud, \$231,550 (100). New office building and passenger station, Willmar, Minn., \$153,000 (20). New repair shop for Diesel locomotives, Havre, Mont., \$381,700 (100). Renew bridge and fill approach, Fairview, Mont., \$119,000 (started). New shop and fuel tanks for Diesel locomotives, Great Falls, Mont., and Laurel, \$201,500 (100). Replacement of boilers and stokers in powerhouse, Havre, Mont., \$101,900 (100). Revision of alignment, Camden, Wash., \$300,000 (100). Two new snowsheds, Single Shot, Mont., \$551,200 (started). Repairs to concrete lining, tunnel No. 2, Pinnacle, Mont., \$223,000 (started). Repairs to bridge No. 17 Silvana, Wash., \$249,000 (100). Construction of tracks at South Agnew mine, Hibbing, Minn., \$154,000 (100). Construction of tracks at various mines, Hibbing, Minn., \$129,600 (90). New car repair shed, Seattle, Wash., \$243,000 (100). Repairs to ore docks, Allouez, Wis., \$190,000 (10). Construction of hotel for railway employees, Appleyard, Wash., \$135,200 (100). Repairing and reinforcement of bridges, Spokane, Wash., division, \$118,500 (100). Repair and reinforcement of bridges, Butte, Mont., division, \$183,335 (100). Extension of various passing sidings and installation of 112-lb. rail on main tracks, Brook Park, Minn., to Grandy, \$278,820 (100). Restore roadbed section, apply ballast and install 25 miles of 112-lb. rail, Campbell, Minn., to Breck, \$422,350 (100). Widening embankments, applying additional ballast and laying 24 miles of 112-lb. rail, Williston, N. D., \$290,350 (100). Widening embankments, installation of additional ballast and 112-lb. rail, Lohman, Mont., to Havre, \$203,352 (50). Widening embankments, installation of additional ballast and 112-lb. rail, Shelby, Mont., to Cut Bank, \$306,370 (100). Widening embankments, installation of additional ballast and 112-lb. rail, Elmira, Mont., to Colburn, \$116,400 (100). Widening embankments, installation of additional ballast and 112-lb. rail, Lamona, Wash., to Odessa, \$304,250 (100). Installation of ballast and 12 miles of 112-lb. rail, Edmonds, Wash., to Interbay, \$224,500 (100). Renew ballast and install second-hand 90-lb. rail, Nash, Minn., to Crystal, \$100,500 (100). Renew ballast, Mes. division, \$139,000 (50). Renew ballast, Dakota (Minn.) division, \$156,400 (10). Renew ballast, Willmar (Minn.) division, \$230,000 (100). Renew ballast, Butte (Mont.) division, \$160,000 (10). Renew ballast, Kalispell division, \$151,000 (100).

Illinois Central

Grade Crossing Eliminations: Subways: East Mallory avenue, Memphis, Tenn., (100).

Important Work Undertaken: Rebuild bridge over Little Sioux river, Cherokee, Iowa, \$144,500 (50). Replace spans with new girders, Boone River bridge, Webster City, Iowa, \$106,000 (50). Replace arch with girder span over Lynch creek, Jackson, Miss., \$123,770 (100). Replace incline for Mississippi transfer boat, Trotters Point, Miss., \$221,000 (50).

Indianapolis Union

Grade Crossing Eliminations: Subway: Morris street and Belt railway, Indianapolis, Ind., joint with city, \$390,000 (100).

Kansas City Southern

Important Work Undertaken: Reconstruction of substructure of bridge over Arkansas river, Redland, Okla., \$412,000 (100).

Los Angeles Junction

Important Work Undertaken: Construction of seven yard tracks, 3.1 miles, Los Angeles, Cal., \$134,116 (started).

Louisiana & Arkansas

Important Work Undertaken: Additional yard tracks and mechanical department facilities, North Baton Rouge, La., \$100,000 (95).

Louisville & Nashville

First Track: Chesley, Ky., to Homestead, 4.64 miles; at Centertown, Ky., 2.36 miles; Golva, Ky., to Glenbrook, 12 miles.

Grade Crossing Eliminations: Overcrossings: Butler, Ky., \$135,000 (10). Bowling Green, Ky., \$71,000 (10). Rockland, Tenn., \$100,000 (5). Morely, Tenn., \$175,000 (50). La Follette, Tenn., \$79,000 (50). Benton, Tenn., \$271,575 (50). Subway: Dossett, Tenn., \$100,000 (100).

New Line Under Survey: Duo, Ky., to Deane, 16.7 miles.

Important Work Undertaken: Replacement of 11,627 ft. of timber trestle with concrete trestle, Indiana approach to bridge over Ohio river, Henderson, Ky., \$970,000 (50). Centralized traffic control, Strawberry, Ky., to Henderson, including incidental track changes, \$856,764 (60). Grade reduction: 6,300 ft., Benton Cut, Tenn., \$137,673 (10). Installation of two escalators from track level to concourse, joint with N. C. & St. L., Nashville, Tenn., \$100,057 (started). Diesel locomotive repair and servicing facilities, Louisville, Ky., \$361,372 (5). Replacement of 350 ft. double-track deck girder viaduct, Big Laurel river, Corbin, Ky., \$169,466 (started). Replacement of bridge over West Pascagoula river, Gautier, Miss., \$797,526 (started).

Massena Terminal

Grade Crossing Eliminations: Overcrossings: Park avenue, Massena, N. Y., \$56,000 (100). Center street, Massena, N. Y., \$31,000 (100). East Orvis street, Massena, N. Y., \$86,000 (100). East Hatfield street, Massena, N. Y., \$54,000 (100).

Important Work Undertaken: Replacement of bridges across Grasse and Raquette rivers, grade separations at three streets, Massena, N. Y., \$1,200,000 (98).

Missouri-Kansas-Texas

Grade Crossing Eliminations: Overcrossings: State Highway 52, Windsor, Mo., \$75,000 (100). Twenty-third street replacing old reinforced concrete bridge, Oklahoma City, Okla., \$125,000 (30). United States Highway 69, Wagoner, Okla., \$119,400 (100). State Highway 20, east of Austin, Tex., \$466,000 (50). State Highway 29, East of Austin, Tex., \$246,000 (50).

Important Work Undertaken: Raise main track across North Canadian river, including bridge and installation of seven additional 100-ft. girders, also rip rap and jetties, Eufaula, Okla., \$550,000 (100).

Missouri Pacific

Grade Crossing Eliminations: Overcrossings: U. S. Route 69, Wagoner, Okla., \$75,000 (100). Route 49, Sabula, Okla., \$100,000 (75). Conway road, Little Blue, Mo., \$10,000 (100). Grube road, Little Blue, Mo., \$15,000 (100). Chapel road, Little Blue, Mo., \$15,000 (75). Subway: Bridge over 39th street, Elm Park, Mo., \$8,400 (10).

Important Work Undertaken: Install C.T.C., including necessary track changes, Valley Junction, Ill., to Dupu, \$202,770 (100). Application of new tie plates at various points, \$156,000 (100). Construction of bridge, Cache, Ill., \$162,000 (25). Revision of alignment, Blackwell, Mo., \$258,000 (100). Raise track, Granite Bend, Mo., \$484,000 (35). Rebuild five bridges, Reader, Ark., \$103,000 (100). Construction of train yard tracks, Locust Street Yard, N. Little Rock, Ark., \$285,000 (100). Extension of train yard tracks, Texarkana, Ark., \$237,000 (100). Reconstruction of three bridges, Nuckles, Ark., \$161,000 (started). Installation of C.T.C., including necessary track changes, Little Rock, Ark., \$188,000 (60). Reconstruction of bridge, Yancopin, Ark., \$548,000 (100). Relay 56-lb. rail with 70-lb. and 85-lb. rail, and apply new ballast, Litro, La., to Marion, \$111,000 (70). Construct new bridge in connection with main track relocation, Riverton, La., \$649,000 (100). Extension of passing siding, Pawnee, La., to Oakland, \$130,000 (100). Apply second-hand tie plates at various points, \$156,000 (100). Raise track, Little Blue, Mo., \$528,400 (100). Build crosstied trestle, Northrup, Mo., \$119,100 (100). Apply new tie plates at various points, \$156,000 (100). Revision of alignment and gradient, Little Blue, Mo., to Elm Park, \$726,000 (75). Rearrangement of tracks account of flood wall construction, Kansas City, Mo., \$253,400 (35). Construction of lap passing sidings, Comiskey, Kan., \$206,800 (100). Application of additional ballast and relay rail, Hoisington, Kan., to McCracken, \$600,000 (94).

Relocate main tracks, Otis, Kan., \$103,975 (100). Relay rail and apply additional ballast, Osgood, Kan., to Modoc, \$1,056,400 (15). Relocate and extend passing sidings, Van Buren,

Ark., to N. Little Rock, \$112,150 (95). Revision of alignment and gradient, Palarm, Ark., \$269,000 (started). Raise track account flood protective work at various points, \$2,960,000 (10).

(Gulf Coast Lines) Important Work Undertaken: Installation of 22 miles of C.T.C., including necessary track changes, Alcoa, Tex., to Angleton, \$196,640 (25). Construction of 8,392 ft. of main track on the west side, and 3,155 ft. of main track on the east side, of Mississippi river for connections with Baton Rouge bridge, including installation of automatic block signals and 7,622 ft. of yard tracks, Baton Rouge, La., \$644,600 (75).

Nashville, Chattanooga & St. Louis

Grade Crossing Elimination: Overcrossing: Near Dickson, Tenn., \$10,000 (100).

Important Work Undertaken: Grade and curve reduction, Nashville division, \$1,225,500 (100). Revision of alignment, Atlanta division, \$734,000 (95). Revision of alignment to increase speed, Chattanooga division, \$800,800 (90). Revision of alignment of many curves to permit higher speed, Paducah & Memphis division, \$540,000 (75). Construction of 1.6-mile industrial spur, Nashville, Tenn., \$250,000 (100).

New York Central

Grade Crossing Eliminations: Overcrossings: Mount Hope, N. Y. (100). Subways: Bancroft street, Toledo, Ohio, joint with state (60). U. S. Route 21, Willow Freeway, Marcy, Cleveland, Ohio (67).

Important Work Undertaken: Construction of fuel oil facilities for servicing Diesel passenger locomotives at station platforms, Central Terminal, Buffalo, N. Y. (75). Replacement of bridge with twin box culverts and the relocation of tracks to reduce curvature and gradient, Canastota, N. Y. (91). Construction of additional track and signaling facilities, including power-operated cross-overs in place of hand-throw switches, Depew, N. Y. (100). Construction of additional inspection and servicing facilities for Diesel locomotives, Harmon, N. Y. (50). Revision of alignment to reduce curvature, including the construction of a new river channel for new main line tracks, several bridges over state highway and signal pole line, Little Falls, N. Y. (32).

Extension of alternating current distributing system, New York (12). Reconstruction of bridge over North street, including alterations to abutments and backwalls and revision of track alignment, Rochester, N. Y. (100). Relocation of tracks and reconstruction of bridges over Kinderhook and Stockport creeks, Stockport, N. Y. (100). Construction of new boiler plant, Utica, N. Y. (50). Reconstruction of Bridge 707, Rochester, N. Y. (100). Reconstruction of Bridge 45 by adding four piles to bent, Iona Island, N. Y. (50). Replace runway and install new crane, Collinwood, Cleveland, Ohio (50). Extension of electric locomotive shop, Collinwood, Cleveland, Ohio (60). Replace boilers and stokers, Gibson, Ind. (5). Construction of coach-washing facilities, Chicago (100). Additional crossing protection at 20 streets, Mishawaka, Ind. (45). Extension of passing siding, Kenton, Ohio (100).

(Cleveland, Cincinnati, Chicago & St. Louis) **Grade Crossing Eliminations:** Overcrossing: State Route 534, Shadeland avenue, Indianapolis, Ind. (100). Revision of Highway: Relocation of State Highway 127, joint with state, Sherwood, Ohio (100).

Important Work Undertaken: Restoration of Plum Street warehouse after destruction by fire, Cincinnati, Ohio (100). Installation of automatic signals, including remote controlling and interlocking of hand-operated main track switches, Burt, Ohio, to Paget (100). Extensions of 13 ft. to each side of multiple-arch bridge, Weisburg, Ind. (100). Replacement of outbound freight house, including five covered island platforms, concrete driveway and relocation of tracks, Indianapolis, Ind. (100). Installation of automatic signals, including electric locks on all hand-operated main-track switches and higher-speed turnouts, Paget, Ohio, to Columbus (95). Installation of higher speed turnouts and alterations to passing tracks, including remote controlling of various switches, Columbus, Ohio, to Springfield (15). Addition of 6½ ft. to each side of multiple-arch bridge and lined with reinforced concrete, Bonnell, Ind. (85). Construction of 31,000 ft. of track, including a 176-ft. tunnel serving General Motors Corporation plant, Moraine, Ohio (100). Construction of 38,370 ft. of track and rehabilitation of 12,170 ft. of track serving new location of coal-washing plant, Oakland City, Ind. (100).

(Michigan Central) **Important Work Undertaken:** Construction of new meat transfer house, Detroit, Mich. (100).

(Pittsburgh & Lake Erie) **Important Work Undertaken:** Relocation and extension of West Homestead yard tracks account of extension of the plant of the Mesta Machine Company, Homestead, Pa. (100). Approximate cost of the foregoing projects: \$13,966,350.

New York, Chicago & St. Louis

Important Work Undertaken: Extension of machine shop, Conneaut, Ohio, \$150,000 (100). Replace girders, bridge No. 154-16, Painesville, Ohio,

\$127,500 (100). Construction of enginehouse, machine shop and boiler house, Bellevue, Ohio, \$1,429,000 (75). Reconstruction of bridge, Bellevue, Ohio, \$105,000 (90). Relocation of west-bound yard, Bellevue, Ohio, \$156,000 (90). Construction of new office building, Bellevue, Ohio, \$180,000 (100). Revision of alignment to reduce curvature, Arcadia, Ohio, \$116,500 (100). Installation of C.T.C. and necessary passing siding extensions, Arcadia, Ohio, to New Haven, \$467,000 (15). Installation of C.T.C., including the extension of necessary passing sidings, South Whitley, Ohio, to Claypool, \$203,000 (95). Installation of C.T.C., including extension of necessary passing sidings, Arcadia, Ohio, to St. Marys, \$657,000 (20). Extension of passing siding, Lima, Ohio, \$135,600 (100). Revision of gradient, extension of passing siding, Boyleston, Ind., \$157,000 (98). Rebuild boiler house and replace stationary boilers, Frankfort, Ind., \$275,000 (100). Revision of alignment and gradient, Oakland, Ohio, to Fort Recovery, \$455,000 (80).

New York, New Haven & Hartford

Grade Crossing Eliminations: Overcrossings: Bridge over Northampton line, Hamden, Conn., \$435,000 (5). Bridge over Springfield line, Wallingford, Conn., \$140,000 (20). New bridge over the Westfield branch, Meriden, Conn., \$110,000 (100). Bridge over the Rockville branch, Vernon, Conn., \$60,000 (1). Subway: Buckland, Conn., \$75,000 (10). Reconstruction of Existing Grade Crossing Structures: Reconstruction of Treadwell Street overcrossing, Hamden, Conn., \$20,000 (100).

Important Work Undertaken: Reconstruction of buses and circuit breakers at power plant, Cos Cob, Conn., \$458,270 (75). Installation of capacitors at sub-stations, electric zone, \$239,600 (100). Reconstruction of two northerly spans of bridge, New Haven, Conn., \$115,000 (100). Revision of track in connection with signal changes, Brayton avenue, Providence, R. I., \$378,300 (100). Construction of Diesel locomotive shop facilities, New Haven, Conn., \$675,000 (60). Construction of car-washing facilities, Boston, Mass., \$150,000 (100). Alterations to motor storage yard, New Haven, Conn., \$119,500 (20). Reconstruction of bridge, Montwese, Conn., \$230,000 (5). Extension of freight house, Harlem river, \$170,000 (100). Construction of steamline to station, Providence, R. I., \$175,000 (10). Widen driveways and construct tracks to warehouses in No. 7 yard, Boston, Mass., \$158,100 (100). Installation of steam line to freighthouse and other buildings, New Haven, Conn., \$100,000 (25). Installation of car retarders in westbound classification yard, Montwese, Conn., \$113,539 (50). New general office building, New Haven, Conn., \$2,000,000 (20). Installation of car retarders, Montwese yard, Montwese, Conn., \$145,000 (100).

New York, Ontario & Western

Important Work Undertaken: Facilities for repairing and fueling Diesel locomotives, Middletown, N. Y., and Mayfield, Pa., \$169,941 (58).

New York, Susquehanna & Western

Important Work Undertaken: Additional yard tracks, relocation of certain existing tracks and removal of others, Edgewater, N. J., \$180,000 (100).

Norfolk & Western

Grade Crossing Eliminations: Subways: Iron-ton, Ohio, to eliminate two grade crossings, \$40,000 (100).

Important Work Undertaken: Construction of new single-track bridge, including 190-ft. bascule-type drawspan and necessary track changes, Norfolk, Va., \$750,000 (100). Construction of additional tracks, standpipes, engine service building, two ice houses, two 135-ft. inspection pits, concrete engine washing platform and ash disposal plant, Williamson, W. Va., \$300,000 (100). Installation of car retarders, Portsmouth, Ohio, \$150,000 (100). Install new steel girders or pre-cast concrete slabs, rebuild backwalls and bridge seats in six bridges, Norfolk, Va., to Roanoke, \$110,000 (100). Construction of fireproof pier with steel and metal warehouse, two land warehouses, two gantry cranes, concrete driveways and a 150-ton track scale with supporting trackage, Lambert Point, Va., \$5,750,000 (35). Construction of 30,000 ft. of track for coal cleaning and loading plant, Wilcoe, W. Va., \$530,000 (100). Installation of 15 new deck plategirder steel spans and six new steel bents with concrete pedestals, Glen Jean, Ohio, \$220,000 (100).

Installation of C.T.C. and position-light automatic signals, including extension of five passing sidings, Walton, Va., to Bristol, \$1,116,500 (100). Construction of 1.11 miles of spur tracks and siding to serve coal mine, Levisa branch, Ky., \$304,000 (100). Construction of five-story office building, including office furniture and steam line from powerhouse, Bluefield, W. Va., \$700,000 (started). Install steel girders or pre-cast concrete slabs and rebuild backwalls and piers in 20 bridges, Radford, Va., to Bristol, \$213,850 (25). Install steel girders or pre-cast concrete slabs, rebuild backwalls and piers in 10 bridges, Columbus, Ohio, district, \$112,800 (10). Construction of

enginehouse, Ohio, \$467,000. Installation of C.T.C. from Vera, Ohio, to Claire, including the extension of four passing sidings, Peebles, Ohio, to Mineral Springs, \$2,948,000 (20). Construction of 1,469-ft. siding, including a seven-span deck plate-girder and deck truss bridge over New river to serve American Viscose Corporation, Radford, Va., \$397,000 (25). Construction of 6,640 ft. of spur track and 14,810 ft. of sidings to serve coal development, Lenore branch, W. Va., \$248,000 (100). Construction of 5.27 miles of spur track, 1.49 miles of passing track and 17,145 ft. of siding to serve coal development, Tug Fork branch, W. Va., \$1,253,600 (25). Construction of 17,200 ft. of spur track up Grapevine creek, including two siding layouts with 9,945 ft. of track, Thacker, W. Va., \$215,000 (100). Modernization of passenger station, including enlarged portico, new butterfly-type train sheds, glass-block window concourse, stairway and escalators, Roanoke, Va., \$345,000 (started). Construction of 10,070 ft. of spur track and 24,686 ft. of siding to serve coal development, Lenore branch, W. Va., \$319,000 (25). Rearrangement of boiler house, including equipment for workrooms, offices, toilets, etc. Conversion of freight station into material storage and locker rooms, construction of 260-ft. inspection pit with concrete jacking pads and other facilities, Norfolk, Va., \$110,000 (started). Construction of new coaling station and various engine servicing facilities, including the rearrangement and extension of 2,451 ft. of track, Shenandoah, Va., \$121,000 (started).

Northeast Oklahoma
First Track: 0.15 miles, Picher, Okla.

Northern Pacific
Second Track: 1.67 miles, Jamestown, N. D., to Pipesstem Tower.
New Road Under Construction: New Salem, N. D., to Kurtz, 16.27 miles, to replace 25.52 miles of existing line.
Important Work Undertaken: New car shop, storage building and concrete platforms at Brainerd, Minn., \$1,749,500 (100). Two-story brick warehouse, pipe storage building, concrete platforms, ramps and roadways, Duluth, Minn., \$182,800 (100). New Diesel shop, addition to store and oil house, additional fuel and sanding facilities, Mississippi Street shops, St. Paul, Minn., \$610,000 (50). Second main track, new switching leads and ladder tracks in yard, construction of I-beam bridge, and channel changes, Jamestown, N. D., \$446,400 (100). New 500-ton steel coal dock to serve main line, standpipes, water and drainage lines, Beach, N. D., \$107,000 (100). New 16-stall enginehouse, with turntable and incidental trackage, Helena, Mont., \$560,000 (100). Additional icing facilities, toilet room, machinery and equipment, Pasco, Wash., \$340,000 (100). New car shed, drop table, wheel lathe house, wheel lathe and wheel storage track, King street, Seattle, Wash., \$243,000 (100). One-story freight warehouse, two-story office, boiler room, record vault room, toilets, lunchroom, and incidental facilities, Tacoma, Wash., \$173,700 (70).

Pennsylvania
Third Track: Crestline, Ohio, to Bucyrus, 8.97 miles.
Grade Crossing Eliminations: Subways: New bridge on revised alignment. Project, state highway Route 534, Garfield, Ohio.
Highways Closed: County line road closed and traffic diverted to reconstructed overcrossing, Warner road, King of Prussia, Pa. (100). Lay's Private grade crossing, closed, Chase, Md. (100). Total cost of these projects: \$76,500.
Important Work Undertaken: Changes in salt-water fire line, including removal of idle lines; installation of additional lines and relocation of pump and pumphouse, Jersey City, N. J. (100). Construction of fireproof brick tower to replace a wooden one, and installation of new interlocking equipment, Bristol, Pa. (75). Construction of four new stores on south side of Long Island concourse at Pennsylvania station, New York (35). New freight house, Hunter Street yard, Newark, N. J. (100). Reconstruction of bridge over Lopatcong creek, Phillipsburg, N. J. (100). Construction yard facilities to serve Ford Motor assembly plant, Metuchen, N. J. (100). Construction of passing track and supporting yard, including three single-track concrete and steel bridges, grading, electrification, drainage and 16,500 ft. of track, Metuchen, N. J. (50). Addition to Kensington freight station and rearrangement of tracks, Philadelphia, Pa. (100). Development of industrial sites, Washington, D. C. (90). Construction of side track and bridge across Schuylkill river, Parkers Ford, Pa. (100). Construction of industrial siding to serve Pennsylvania Power & Light company, Selinsgrove, Pa. (100). New and rearranged engine terminal facilities, York, Pa. (90). New employees' toilet and locker building, Wilmington shops, Del. (90). Construction of siding and two bridges to serve Curtis Publishing Company plant, Academy, Pa. (100). Improvement of alignment to eliminate speed restrictions, Watsonstown, Pa. (10). Improvement of alignment to

eliminate speed restrictions, Millersburg, Pa. (30). Replace mechanical interlocking with electro-pneumatic interlocking, including rearrangement of crossovers with provision of electric switch heaters and retirement of passenger station building, Holmes Tower, Philadelphia, Pa. (100). Alterations and additions to the North Philadelphia passenger station, Philadelphia, Pa. (100). Compressed air line in yard, Enola, Pa. (100). Revision of alignment to eliminate speed restriction, Kinkora Heights, Pa. (30). Installation of crossovers and interlocking McVeytown, Pa. (35). Installation of C. T. C., including necessary track changes, Tyrone, Pa., to Lock Haven (100). Revision of alignment and extension of east and west coaling tracks, Denholm, Pa. (100). Change of line owing to construction of flood control dam by the United States government, Blairsville, Pa., to Avonmore (40). Raising three bridges carrying city streets over railroad, Pittsburgh, Pa. (75). Revision of alignment including new bridge over state highway, Garfield, Ohio (100). Extension of water pans, Millbrook, Ohio (100). Construction of new retaining wall, Steubenville, Ohio (60). Relocation of creek channel to eliminate two bridges, Bowerston, Ohio (100). Reconstruction of 512-ft. dock No. 20, Cleveland, Ohio (100). Improvement to locomotive facilities at 28th Street yard, Pittsburgh, Pa. (100). New steam line from Pennsylvania station power plant to 24th street, Pittsburgh, Pa. (100). New steam line from 28th street to 32nd street, Pittsburgh, Pa. (100). Rearrangement of tracks and platforms in Yard D, Pittsburgh, Pa. (20). Installation of car retarders in westward classification yard, Pitcairn, Pa. (100). Construction of 4.03 miles of track to serve coal field, Terre Haute, Ind. (35). Construction of one-story pool car freight station, including necessary driveways and track facilities at 16th street, Chicago (50). Construction of one-story pool car freight station, including necessary driveways and track facilities between Lake and Fulton streets, Chicago (45). Construction of additional yard facilities, including 16,000 ft. of track and 14 turnouts, Hughart yard, Grand Rapids, Mich. (100). Construction of extra stalls at St. Claire enginehouse, including extension of engine pits, new roof, smoke jacks and improvement in track layout, Columbus, Ohio (15). Construction of interlocking plant at the grade crossing of the New York Central, Nickel Plate and Wheeling & Lake Erie, including rearrangement of tracks to permit the Pennsylvania use of Nickel Plate main tracks to eliminate five railroad crossings, Bellevue, Ohio (100). Construction of new 110-ft. turntable to replace 100-ft. table at Spruce street, Columbus, Ohio (100). Changes in crossing protection at 15 grade crossings between 21st street and Clarke road, Gary, Ind. (100). Construction of 8.97 miles of third track, signaled for westward movement with middle track signaled in both directions, Crestline, Ohio, to Bucyrus (100). Approximate cost of the foregoing projects: \$13,968,868.
(Long Island) Grade Crossing Eliminations: Overcrossings: New steel and concrete foot bridge, 51st avenue, Long Island City, N. Y. (75). Subways: Elimination of 12 grade crossings by raising 3.5 miles of double track and 1 mile of four-track railroad about 18 ft. on earth embankment, including five new stations and platforms, and steel and concrete railroad bridges at all crossings, Rosedale, Long Island (4). Elimination of three grade crossings by single-track steel and concrete bridges and 6,000 ft. of track elevation on earth embankment, Farmingdale, N. Y. (90). The approximate cost of these projects: \$8,194,000.

Pere Marquette
Grade Crossing Eliminations: Subway: Edsel B. Ford express highway constructed by and at expense of the state, Detroit, Mich. \$450,000 (started).

Pittsburgh & West Virginia
Important Work Undertaken: Construction of reinforced concrete lining in two tunnels on Donora branch, Carroll township, Washington county, Pa. \$207,000 (30).

Reading
Important Work Undertaken: Reconstruction of bridge over Schuylkill river, Reading, Pa., \$1,118,000 (35). Track to Pennsylvania Power & Light plant, Clement, Pa., \$950,000 (60). Extension to enginehouse, including relocation of township road, tracks and other facilities, Rutherford, Pa., \$392,000 (50). Changes to yard tracks, Wayne Junction, Philadelphia, Pa., \$79,000 (100). Reconstruction and strengthening of bridges, Shamokin, Pa., Fairhill Junction, Newtown Junction, Philadelphia, Pa., \$135,100 (100).

Richmond, Fredericksburg & Potomac
Important Work Undertaken: Construction of third track from Mile Post 98 to 104, including grading and signaling, south of Alexandria, Va., \$750,000 (60).

St. Louis-San Francisco
Second Track: Helm, Mo., to Hancock, 3.14 miles.

Grade Crossing Eliminations: Overcrossings: United States route 60, Wyandotte, Okla., \$150,000 (100). United States route 271, Cedars, Okla., \$34,000 (100). State highway No. 40, Forkland, Ala., \$112,462 (started). County road, Robertsville, Mo., \$8,000 (100). Important Work Undertaken: Second track for eastward traffic, Helm, Mo., to Hancock, 3.14 miles, \$700,000 (100). Reconstruction of old truss span with through truss and one I-beam span, including two concrete piers and 1 abutment; also raise 1,900 ft. of track approaches, Kellyville, Okla., \$101,296 (25). Construction of new freight house facilities, including necessary additional switch tracks and rearrangement of present tracks, Birmingham, Ala., \$236,866 (started). Construction of brick shop building, including necessary facilities for servicing and repairing Diesel locomotives, Lindenwood, Mo., \$266,904 (started).

St. Louis Southwestern
Important Work Undertaken: Extension of freight house 314 ft. to replace present 300 ft. freight house, rearrange track, Dallas, Tex., \$245,000 (100). Replace existing 80 ft. steel bridge with two 100 ft. steel girders on concrete piers, Garland City, Ark., \$183,000 (100).

Seaboard Air Line
First Track: Woods, Fla., to Victor, 3.72 mi.
Important Work Undertaken: Construction of Diesel locomotive repair shop facilities, Jacksonville, Fla., \$815,000 (70). Construction of phosphate elevator, Tampa, Fla., \$515,000 (started). Construction of passenger and freight station facilities, Wildwood, Fla., \$470,000 (85). Construction of tracks to serve phosphate mines, Mulberry, Fla., \$343,000 (100). Replacement of ballast-deck trestle with new standard ballast-deck trestle over Pee Dee river, Poston, S. C., \$500,000 (100). Construction of switching track, Hialeah, Fla., \$190,000 (30). Reconstruction of bridge over Congaree river, near Columbia, S. C., \$415,000 (60). Replace Nottoway River bridge with steel spans on steel piles filled with concrete, near Franklin, Va., \$104,000 (60). Modernization of division office building and freight station, Jacksonville, Fla., \$200,000 (100). Construction of running track, Aberdeen, N. C., to Pine Bluff, \$110,000 (100). Extension and rearrangement of passing tracks, Tampa, Fla., \$170,000 (100). Additional yard facilities, Hamlet, N. C., \$350,000 (100). Installation of C. T. C., including necessary track changes, Waldo, Fla., to Hawthorne, \$171,000 (100). Installation of power-operated switches and controlled signals, Merry Oaks, Lemon Springs and New Hill, N. C., \$300,000 (100).

Southern
Grade Crossing Eliminations: Overcrossings: Jones avenue, Atlanta, Ga., \$85,000 (50). Willowbrook street, High Point, N. C., \$130,000 (30). Greenville, S. C., \$80,000 (15). Lake Junaluska, N. C. (5). Subways: Broad street, Toccoa, Ga., \$223,000 (10). Morganton, N. C., \$85,000 (20). Important Work Undertaken: Construction of additional tracks, Inman yard, Atlanta, Ga., \$133,000 (100). Track serving industrial development, Rock Hill, S. C., \$108,000 (100). Additional tracks, Doraville, Ga., \$220,000 (95). Replacement of timber trestle with embankment and construction of concrete arch culvert, Combs, Tenn., \$199,000 (100). Filling timber trestle and construction of double concrete arch culvert Shelbyville, Ky., \$155,800 (50). Filling timber trestle and construction of concrete arch culvert, Cook Springs, Ala., \$120,100 (90). Filling part of approach trestle to Tombigbee River bridge, Jackson, Ala., \$130,500 (84). Renewal of viaduct over Accotink creek, Springfield, Va., \$443,000 (100). Replacing deck truss bridge and trestle approach with deck plate-girder bridge on new alignment and grade, Heiskell, Tenn., \$132,100 (100). Replacement of through truss bridge with deck plate-girders on new masonry, Bristow, Va., \$186,000 (100).

Southern Pacific
First Track: Between various points in California, 3,083 miles; between various points in Oregon, 0.172 miles; between various points in Arizona, 0.520 miles—total: 3,775 miles.
Second Track: Redwood Junction, Cal., to Niles line, 0.026 miles.
Grade Crossing Eliminations: Overcrossings: Jefferson, Ore., \$50,000 (100). Fifth avenue, Oakland, Cal., \$1,800,000 (10). Auburn, Cal., \$100,000 (80). Anaheim street, Wilmington, Cal., \$900,000 (40). Nicholson avenue, Wilmington, Cal., \$300,000 (40). Subway: Sacramento, Cal., \$300,000 (80). Yuba City, Cal., \$85,000 (75). Auburn, Cal., \$100,000 (80). Important Work Undertaken: Construction of 30,000 ft. of track, yard offices and other facilities to serve General Motors' new assembly plant between Raymer, Cal., and Lewitt, \$383,000 (65). Construction of yard and drill tracks in connection with vegetable packing house developments, Slater, Cal., \$122,000 (100). Construction of new freight yard to supplement the Sacramento yards, Benali, Cal., \$110,000 (100). Construction of additional yard tracks, Phoenix, Ariz., \$165,000 (100). Relocation of present tracks and

other yard facilities, Phoenix, Ariz., \$127,000 (100). Enlargement of 500 ft. of tunnel No. 6, including installation of concrete sills, and heading to carry off exhaust fumes, Cuesta-Thyle, Cal., \$152,000 (30).

Installation of additional piles, Great Salt Lake trestle, Utah, \$609,000 (100). Reconstruction of 1,470 ft. of main track 75 ft. from the toe of an unstable hill, including change in the channel of the Sacramento river, Dunsmuir, Cal., \$115,000 (100).

Spokane, Portland & Seattle

Important Work Undertaken: Filling of three timber bridges having a total length of 132 ft., replacing them with 12-ft. by 12-ft. reinforced concrete box culverts, Oregon Trunk Railway, Dike, Ore., \$183,613 (100).

Texas & New Orleans

Grade Crossing Eliminations: Overcrossings: Thomaston, Tex., \$268,000 (100). Uvalde, Tex., \$128,000 (3). Austin, Tex., \$273,000 (35). Dunlay, Tex., \$284,000 (40). Sanderson, Tex., \$358,000 (3).

Important Work Undertaken: Extension of enginehouse, including track facilities, Houston, Tex., \$126,665 (100).

Texas & Pacific

Important Work Undertaken: Revision of alignment and gradient, 2.4 miles, near Jefferson, Tex., \$500,000 (100).

Union Pacific

Grade Crossing Eliminations: Elimination of grade crossings on Terminal Island Freeway serving Los Angeles and Long Beach harbors including Hobson avenue overcrossing, \$1,936,000; Nicholson Avenue overcrossing, \$350,000; overcrossing at Mead yard, \$997,600; overcrossing at Cerritos yard, \$691,900; all at San Pedro, Cal. (35). Other Overcrossings: Topaz, Idaho, \$98,000 (100). Bridal Veil, Ore., \$197,000 (100). Peru, Wyo., \$125,610 (100). Riverdale, Utah, \$452,000 (100).

Important Work Undertaken: Installation of C. T. C., Huntington, Ore., to La Grande, 100 miles, including incidental track changes, \$1,300,555 (15). One-story warehouse and office building, Los Angeles, Cal., \$110,000 (100). Warehouse, including paving and storm sewer, Denver, Colo., \$192,850 (45). One-story produce warehouse, including spur track, Omaha, Neb., \$221,200 (25). Revision of alignment, Oneonta, Ore., to Multnomah Falls, \$116,729 (100). New well, including installation of electric-driven pump, Kelso, Cal., \$143,960 (60). New warehouse, platform, poultry dock and additional trackage, including paving and relocation of power lines and drainage facilities, Los Angeles, Cal., \$179,164 (100). Installation of C. T. C., Pocatello, Idaho, to Glenns Ferry, including extension of 34 passing sidings and other incidental track changes, \$2,055,000 (100). Replace timber lining with reinforced concrete, tunnel No. 26, Olympia branch, \$177,700 (15). Replace Bridge 842.33, Marston, Wyo., with heavier structure, \$110,700 (100). Relocation of 1.93 miles of main track, including one grade separation structure, Hermosa Junction, Wyo., \$244,627 (100). Construct new well pump houses and pipe lines, and install electric-operated pumps, Orchard, Idaho, \$299,500 (100). Additional tracks, including floodlights, drainage facilities and yard office, Kansas City, Kan., \$244,357 (100). Additional tracks, installation of interlocking, purchase and rehabilitation of 135 ft. of Salt Lake, Garfield & Western tracks, Salt Lake City, Utah, \$118,732 (60). Construct 8-in. steam line and 3-in. return line in concrete box, Omaha shops, Omaha, Neb., \$100,000 (100). Renewal of abutments under bridge and raise track 3 ft., Elkhorn, Neb., \$120,375 (70). Construction of 13.51 miles of new line, replacing 9.37 miles of line, and raising grade on 1.13 miles of existing line, Cascade, Idaho, to Donnelly, account of Cascade reservoir, \$455,037 (100).

Union Railroad

Important Work Undertaken: Relocation of bridges and viaducts between East Pittsburgh, Pa., and Bessemer, including double-track, high-grade viaduct and new single track, low-grade viaduct, \$2,750,000 (95).

Virginian

Important Work Undertaken: Rehabilitation and modernization of power plant, Narrows, Va., \$3,852,811 (5). Installation of automatic signals, including necessary track changes at interlockings, Sewall's Point, Va., to South Branch, \$290,000 (100).

Western Maryland

Important Work Undertaken: Construction of timber apron, 970 ft. long, on south side of Pier 5, Port Covington, Baltimore, Md., \$180,000 (100). Construction of side tracks serving coal and coke facilities, Bayard, W. Va., \$400,000 (60). Construction of side tracks serving coal mine, Ida May, W. Va., \$100,000 (50).

Western Pacific

Important Work Undertaken: Construction of Diesel and locomotive shop and servicing facilities, Oakland, Cal., \$500,000 (25).

Wheeling & Lake Erie

Important Work Undertaken: Construction of engine and yard terminal facilities, including enginehouse, coaling plant, sanding plant, water and treating plant and other incidental facilities, Cleveland, Ohio, \$593,476 (70). Relocation of main track, Pine Valley, Ohio, \$313,572 (95).

CANADA

Canadian National

New Road Under Construction: Barraute, Que., to Kiask Falls.

Grade Crossing Eliminations: Reconstruction of existing grade crossing structures: Replacing substructure of overhead bridge, Main street, Harrisburg, Ont. (100).

Important Work Undertaken: Restoration of piers of bridge over Grand Narrows, Sidney, N. S. (to be completed in 1948). Strengthening steel bridges at various various points on Cascapedia and Chandler subdivisions (to be completed in 1948). Strengthening superstructure, Victoria bridge, Montreal, Que. (to be completed in 1948). Improvements to terminal facilities, Garneau, Que. (to be completed in 1947). Construction of signal repair shop, Point St. Charles, Montreal, Que. (to be completed in 1947). Installation of two generating units and the retirement of four boilers in powerhouse, Stratford, Ont. (to be completed in 1947). Construction of new wing and remodeling and adding to passenger station, Edmonton, Alta. (to be completed in 1947). Reconstruction of pole line, Mont Joli, Que., to Riviere du Loup (100). Reconstruct pole line, Vaudreuil, Que., to Lancaster (100). Reconstruction of pole line, Port Hope, Ont., to Oshawa (100). Repairs to pole line, Port Arthur, Ont., to Atikokan (100).

Canadian Pacific

Grade Crossing Elimination: Overcrossing: Belle Plaine, Sask., cost unknown (100).

Important Work Undertaken: Construction of reinforced concrete coal dock, 200-ton capacity and two-track cinder disposal plant, including extensive changes to yard tracks and approximately 23,000 cu. yd. of grading, Bay Shore, West St. John, N. B., \$110,500 (100). Construction of boiler house, stores, office building and 40,000-gallon water tank, including water lines and drainage facilities, St. John, N. B., \$111,400 (100). Renewal of six bridges, Mattawamkeag Sd., Me. \$285,663 (100). Construction of new station, with necessary track and signal changes, Leaside, Ont., \$295,000 (85). (Lake Erie & Northern) First Track: Port Dover, Ont., 0.28 miles.

Newfoundland

Important Work Undertaken: Construction of steel and reinforced concrete-blocks, freight shed, St. John's, N. F., \$150,000 (100).

Toronto, Hamilton & Buffalo

Important Work Undertaken: Replacing timber deck, dock No. 1, Port Maitland, Ont., \$87,000 (100).

MEXICO

National Railways of Mexico

Grade Crossing Elimination: Overcrossing: DA 183, \$10,000 (100).

Important Work Undertaken: Construction of new bridge, Quioitepec, Oax., \$120,000 (100). Construction of new bridge, San Pedrito, Oax., \$212,000 (100). Construction of new hospital, Tierra Blanca, Ver., \$100,000 (65). Construction of new hospital, Matias Romero, Oax., \$100,000 (40).

Railway Materials—How Much and When?

(Continued from page 57)

time the average unit cost of locomotive coal jumped from \$2.45 to \$3.73 a ton—an increase of 52.2 per cent. While most procurement officers realize that substantial price increases were warranted in view of the wage increases and other rising operating costs, nevertheless they believe that they are not receiving the kind of coal required for most efficient firing. The general purchasing agent of a road that uses an average of 400 carloads of coal daily, commenting on the kind of coal now being used, declared: "Coal continued to move to export markets where the poorer grades have been accepted, and so long as this outlet for coal continues, we can hardly expect to see any improvement in the preparation of railway coal."

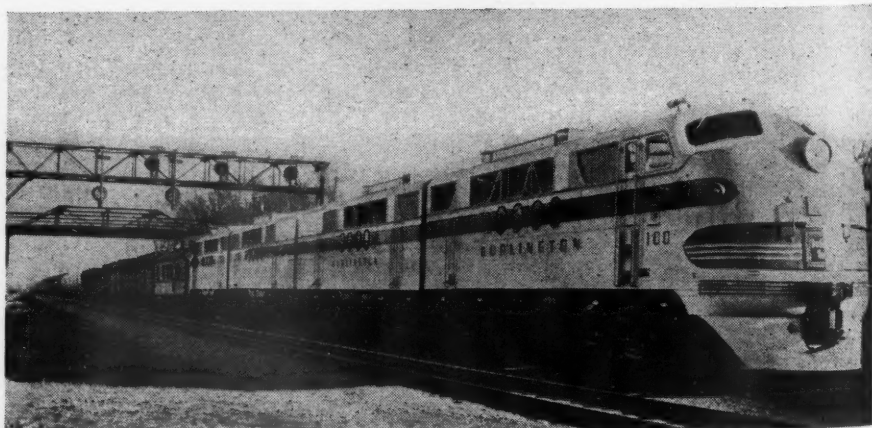
The coal situation in Canada, insofar as the railways were concerned during 1946, was somewhat easier than during the preceding year and the roads were enabled to maintain their stock positions without too much difficulty. Quality continued to be a source of some concern, but in view of the general conditions, there was little cause for complaint. Comparatively few failures were attributed directly to the use of inferior coal.

Prospects for 1947 indicate that requirements will be met, since procurement officers anticipate a small reduction in their needs.

During 1945 Canada imported 24,588,702 tons of fuel from the United States, including bituminous, anthracite, briquettes, lignite and sub-bituminous coal, while during the first five months of 1946 imports totaled only 5,813,390 tons.

Competent observers claim Canadian coal mines are doing far better with their operating and production processes than ever before. In addition, heavy purchases of new equipment during the last two years have greatly improved Canada's position as a coal producer.

* * *



Fast Changes in Communications

Rapid developments in radio and inductive trainphone systems accompany increased use of carrier on line wires providing more long-distance telephone and telegraph printer message capacity

DURING 1946 marked progress was made in the development and installation of train communication, which is the newest facility in railroad communication, and rapid strides were also made in the extension of carrier on existing line wires for new telephone service, as well as printing telegraph, thereby expediting message traffic. Much new work and many replacements were delayed because of shortages of certain materials and skilled men, but this situation is improving. Beamed relay radio is being developed for use in lieu of wires on pole lines, but this system is not as yet considered practicable for railroad uses. In the meantime, the Western Union Telegraph Company proposes to change over to beamed radio

By JOHN H. DUNN
Signal and Communications Editor

The railroads have much to look forward to in the field of telegraph and telephone service, because of numerous new forms of communication developed in recent years, and also because of important improvements in older systems. This will insure better and quicker service, and also more of it, for a correspondingly smaller cost.

for transmission of commercial message traffic between principal cities, and thereby relinquish ownership or joint

ownership of pole lines on railroads. This large-scale change from long-established practices may cause difficulties and heavy expenses to both parties temporarily, but, in the long run, may be beneficial to all concerned.

Review of Train Communication

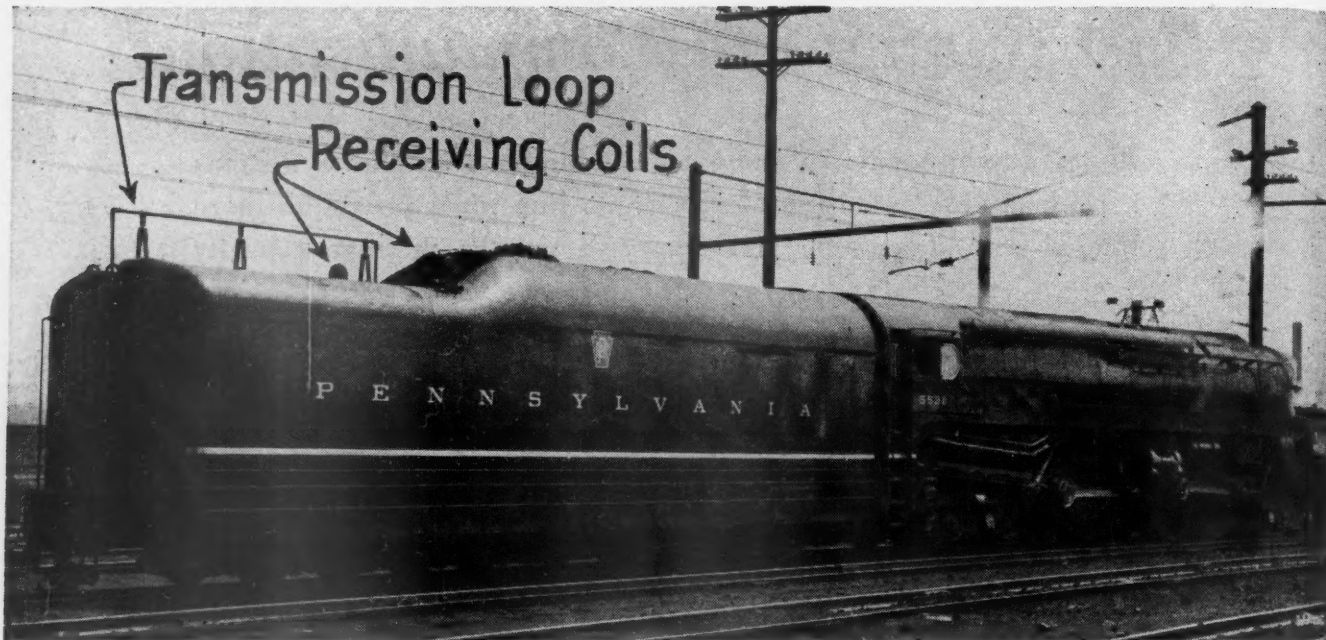
Being a new development, train communication received much attention on the railroads during the past year. Many tests and advances were made but the total number of projects completed and placed in service was disappointing in consideration of the prospects at the beginning of the year. The technical developments in train and yard communication made during 1946 were discussed in detail in four papers presented at the recent convention of the Communications section, Association of American Railroads, in Detroit, Mich., November 19-21. These papers were published in full in the December issue of *Railway Signaling*, and, therefore, only a few of the more important aspects will be dealt with here.

Space radio equipment had been highly developed for war-time use, and, therefore, when applying such systems to railroads, the major problem was to develop housings and mountings which would protect the apparatus from dust, moisture and shock, as encountered in railroad service. Another problem was to develop an antenna short enough to meet clearance requirements when mounted on locomotives and railroad cars.

Inductive train communication, on the other hand, is purely a railroad development, which has been under way for about 20 years by the Union Switch & Signal Co., with the cooperation of several railroads, primarily the Bessemer & Lake Erie and the Pennsylvania. Also within the past four years the Aireon Company has cooperated with the Kansas City Southern, the New York Central and other railroads in developing a train communication system based on the inductive principle. Each major step in this long series of developments was explained in detail in the papers mentioned above. In brief, therefore, the equipment, both inductive and space radio, is available to provide high-grade communication in road and yard service.



Radio communication is in service on 10 locomotives in the Santa Fe yard near Chicago



One of approximately 281 Pennsylvania locomotives equipped with inductive train communication for operation on 245 miles of four-track road between Harrisburg, Pa., and Pittsburgh

New Mileage of Telephone Train Dispatching and Long-Distance Telephone Service

| Railroad | New Mileage of Road Dispatched by Telephone | Miles of New Long-Distance Telephone Circuits |
|-------------------|---|---|
| A. T. & S. F. | 1,023 | 1,023 |
| B. & O. | 39 | 1,260 |
| B. of T. N. Y. | 141 | 8,779 |
| C. F. | 14 | 297 |
| C. of G. | 14 | 96 |
| C. & O. | 317 | 225 |
| C. & N. W. | 359 | 2,624 |
| C. B. & Q. | 90 | 245 |
| C. G. W. | 12 | 275 |
| C. M. St. P. & P. | 12 | 251 |
| D. & H. | 80 | 80 |
| D. & R. G. W. | 40 | 40 |
| G. N. | 130 | 217 |
| G. M. & O. | 236 | 217 |
| I. C. | 34 | 83 |
| K. C. S. | 10 | 2,964 |
| M. P. | 374 | 374 |
| N. Y. C. | 255 | 255 |
| C. C. C. & St. L. | 38 | 38 |
| N. P. | 4 | 305 |
| P. E. | 1,179 | 1,179 |
| St. L.-S. F. | 203 | 40 |
| S. A. L. | 1,283 | 1,283 |
| Southern | 790 | 790 |
| S. P. | 591 | 591 |
| T. & N. O. | 181 | 181 |
| T. & P. | 30 | 30 |
| U. P. | 1,823 | 1,823 |
| Virginian | | |
| W. P. | | |
| Totals | 1,590 | 25,348 |

At the hearings before the Federal Communications Commission in September, 1945, the railroads made a strong plea for the need of radio for train communication on their lines, and the commission assigned 60 clear channels, as well as shared channels in the television ranges. At the recent convention of the Communications section, A. A. R., J. H. Wofford, Engineering division, Federal Communications Commission, chided the railroads for failure to use the channels available, when he said: "The sharing problem is not particularly acute. The possibilities of the 60 channels now available for the service have not been exhausted. Only 18 of the nation's railroads have licensed equipment, and, as of October, this equipment included only 39 land stations and 531 mobile units, scattered across the country.

"I should like to stress that the commission has indicated its approval of radio for railroad use by making liberal provision for it and by establishing a separate set of rules for the industry."

Mr. Wofford's criticism of the limited

activity of the railroads in applying radio would ordinarily be quite proper, but, as a matter of fact, the general conditions in this country were in such turmoil throughout 1946 that there was not much opportunity for railroad managements or anyone else to make decisions on long-term large-scale projects, and even if they had done so, the manufacturers would have had difficulty in supplying all the equipment and materials necessary. For example, back in 1945 the Denver & Rio Grande Western authorized the installation of train communication in 15 locomotives, 15 cabooses and 10 wayside stations for operation on 830 miles between Denver, Colo., and Salt Lake City, Utah. The train communication equipment was delivered on schedule, and was installed in the wayside stations, 4 locomotives and 4 cabooses early in 1946. Installation on the remainder of the locomotives and cabooses, however, has been delayed because of the inability to secure conduit and fittings.

This project, which involves Aireon communication equipment, uses space radio between the two ends of a

Permanent Installations of Train Communication Placed in Service 1946

| Railroad | From | To | Miles of Road | No. of Locomotives | No. of Cabooses or Other Cars | No. of Wayside Stations | Space or Inductive Equipment | Frequency | Manufacturer | Power Supply on Caboose |
|-------------------|--------------------|----------------------|---------------|--------------------|-------------------------------|-------------------------|------------------------------|------------|--------------|-------------------------|
| C. B. & Q. | Hastings, Neb. | Denver, Colo. | 386 | 22 | 8 | 0 | Space | 159.690 mc | Bendix | Axle Gen. |
| C. M. St. P. & P. | Milwaukee, Wis. | Kansas City, Mo. | 508 | 2 | 2 | 0 | Space | 158.73 mc | Bendix | Axle Gen. |
| C. R. I. & P. | Chicago | Council Bluffs, Iowa | .. | 1 | 1 | 4 | Space | ..... | Sperry | Diesel Gen. |
| | Rock Island, Ill. | Ft. Worth, Tex. | .. | 2 | 1 | 0 | Space | ..... | Galvin | Axle Gen. |
| | Rock Island, Ill. | Minneapolis, Minn. | .. | 2 | 1 | 2 | Space | ..... | Galvin | Axle Gen. |
| D. & R. G. W. | Denver, Colo. | Salt Lake City, Utah | 830 | 4* | 4* | 10 | Both | 159.81 mc | Aireon | Eng.-driv. Gen. |
| N. Y. C. | Indianapolis, Ind. | Springfield, Ohio | 139 | 10 | 10 | 21 | Inductive | 175 kc | Aireon | Axle-driv. Gen. |
| Penna. | Harrisburg, Pa. | Pittsburgh | 245 | 300 | 100 | 16 | Inductive | 88 kc | Union | |
| | | | | | | | | 144 kc | | |
| P. M. | Detroit, Mich. | Grand Rapids | 152 | 2 | 2 | 0 | Space | 161.49 mc | Farnsworth | |

Legend: *—Equipment now being installed on 11 more.

Rio Grande Diesel-electric freight locomotives are equipped with combination inductive and space radio train communication for operation on 830 miles between Denver, Colo., and Salt Lake City, Utah



The Pere Marquette has space radio on its new high-speed Diesel-electric streamlined passenger trains operated between Detroit, Mich., and Grand Rapids

train and between trains, and inductive equipment between trains and wayside stations.

New Circuit Miles Derived In 1946
By Superimposing Carrier On Existing
Line Wires

| Railroad | Circuit Miles for Telephones, Mostly Long Distance | Circuit Miles for Telegraph, Mostly Printer Service |
|-------------------|---|--|
| A. T. & S. F. | 310 | ... |
| B. & O. | 1,260 | 2,354 |
| C. N. | ... | 1,537 |
| C. P. | 8,475 | 8,586 |
| C. & N. W. | 255 | ... |
| C. B. & Q. | 1,844 | 3,820 |
| C. M. St. P. & P. | 135 | 698 |
| C. R. I. & P. | ... | 1,535 |
| D. M. & I. R. | 348 | ... |
| D. & R. G. W. | 251 | 746 |
| Erie | 284 | 537 |
| G. N. | 80 | ... |
| G. M. & O. | 1,290 | 2,580 |
| I. C. | 346 | ... |
| K. C. S. | 129 | ... |
| M. P. | 1,051 | ... |
| N. Y. C. | 2,602 | 1,357 |
| C. C. C. & St. L. | 374 | ... |
| M. C. | 255 | 255 |
| P. & L. E. | 62 | ... |
| N. & W. | 220 | ... |
| Penna. | 325 | ... |
| St. L. S. F. | 305 | ... |
| S. A. L. | 1,179 | ... |
| Southern | 423 | ... |
| S. P. | 1,152 | 782 |
| T. & N. O. | 507 | ... |
| T. & P. | 591 | ... |
| U. P. | 181 | 20,785 |
| Wabash | 113 | ... |
| W. P. | 1,823 | 1,925 |
| Totals | 26,170 | 47,497 |

The New York Central was able to secure all the material for an installation of Aireon inductive train communication in 10 locomotives, 10 cabooses and 21 wayside stations on a single-track line between Indianapolis, Ind., and Springfield, Ohio, this project being finally completed a few months ago.

The Pennsylvania, on August 7, 1944, announced a project to install inductive train communication, using equipment made by the Union Switch & Signal Co., on 245 miles of four-track road between Harrisburg, Pa., and Pittsburgh, this being in addition to a development project which had been under way for some time on a branch line between Trenton, N. J., and Phillipsburg. Numerous delays were encountered on the Harrisburg-Pittsburgh project, so that it was not until October 30, 1946, that the Pennsylvania issued an official news release stating that the installation was nearing completion, and that, including the project on the branch, the Pennsylvania had train communication in service in 150 passenger locomotives, 131 freight locomotives, 100 cabin cars, and 16 wayside control towers. The installations are on 319 miles of road, including 1,056 miles of track. New locomotives on order for service on main tracks are to be equipped for train communication.

In November the Pennsylvania released information concerning the development of an auxiliary device, known as the carryphone, to be used by trainmen as a part of the trainphone system, when on foot inspecting a train or when flagging, to communicate with men in the locomotive, the caboose or the nearest wayside office equipped.

The Kansas City Southern was a pioneer in the field of train communication, having completed an installation in 1945 of the Aireon inductive system on 650 miles between Kansas City, Mo., and Shreveport, La., with equipment in 1 passenger locomotive, 4 freight locomotives, 4 cabooses, 1 business car, 20 wayside stations and 2 yard offices. During 1946, train communication equipment was installed in both ends of one new Diesel-electric locomotive, and equipment is being installed in seven locomotives now on order for delivery in 1947.

Installations of Space Radio

With reference to space radio on road trains, the Chicago, Burlington & Quincy completed the most extensive installation in 1946, using Bendix equipment for a project including 22 locomotives and 8 cabooses for operation on 386 miles between Hastings, Neb., and Denver,



The Burlington has installed space radio communication on all of the 22 switching locomotives used in the yards and terminal service throughout the extensive Chicago terminal area. Below—The Pennsylvania made a new installation of telegraph printer equipment in the Chicago office



Colo. This equipment is for communication between the two ends of a train and between trains, with no wayside offices equipped. Based on the same sort of operation, the Chicago, Milwaukee, St. Paul & Pacific has installed Bendix space radio equipment in two locomotives and two cabooses being operated on through freight trains on 508 miles between Milwaukee, Wis., and Kansas City, Mo.

The Pere Marquette installed Farnsworth radio equipment on two new streamlined Diesel-electric passenger trains, the "Pere Marquettes," being operated on 152 miles between Detroit, Mich., and Grand Rapids. The communication equipment is located in the locomotives for use by the enginemen, and in the dining cars for use by the conductor or trainmen. A wayside station, in a yard office near Grand Rapids, permits communication between this office and the trains when within a range of several miles.

Yard Communication

In the field of yard and terminal communication, the railroads made 14 installations which, on the whole, was

fairly good progress considering the shortages of materials. Inductive equipment made by the Union Switch & Signal Co. was installed at three yards, one on the Chesapeake & Ohio and two on the Burlington; space radio was installed in the Chicago terminal area on the Burlington, as well as in 10 yards on other roads, as listed in the accompanying table.

The Burlington project in Chicago is of special interest because it demonstrates the benefits of communication between the yardmaster's offices and the 22 locomotives used to serve industries throughout an extensive terminal area. Space radio equipment made by Bendix is used in this project. The fixed radio station, on top of the Burlington's general office building, is connected by telephone lines to the offices of three yardmasters.

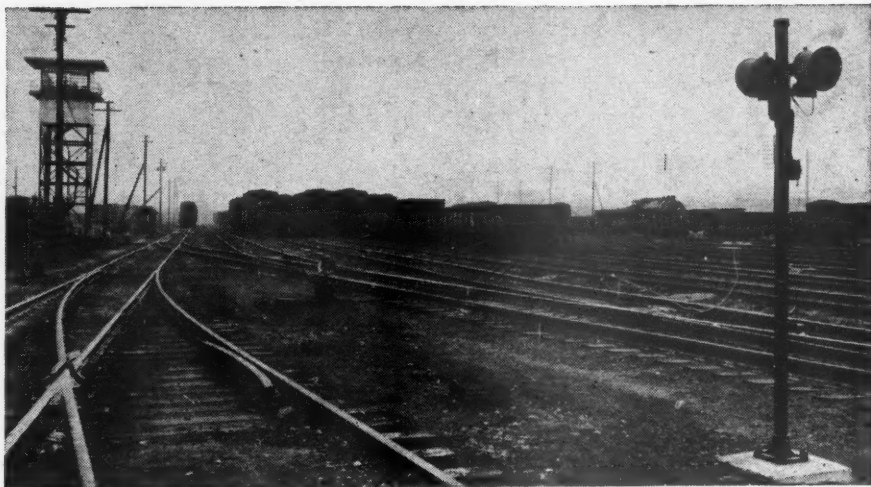
Printing Telegraph Placed In Service In 1946

| Railroad | Miles of Circuits | No. of Machines |
|------------------------|-------------------|-----------------|
| A. T. & S. F. | 704 | 8 |
| A. C. L. | 448 | 2 |
| B. & O. | 2,354 | 24 |
| C. N. | 1,063 | 32 |
| C. P. | 9,580 | 73 |
| C. of G. | 399 | 4 |
| C. B. & O. | 6,025 | 50 |
| C. M. St. P. & P. | 272 | 5 |
| C. R. I. & P. | 1,535 | 4 |
| C. & S. | | 2 |
| D. & H. | 200 | 2 |
| D. & R. G. W. | 746 | 3 |
| Erie | 766 | 16 |
| I. C. | 262 | 5 |
| N. Y. C. | 1,613 | 4 |
| M. C. | 255 | 1 |
| P. & L. E. | 65 | 1 |
| N. Y. C. & St. L. | 1,478 | 101 |
| Penna. | 28 | 2 |
| P. M. | 979 | 28 |
| Reading | 108 | 5 |
| R. F. & P. | | 4 |
| S. A. L. | 213 | 2 |
| S. P. | 782 | |
| T. & N. O. | 360 | 12 |
| T. & P. | 34 | 6 |
| U. P. | 21,225 | 63 |
| W. P. | 1,952 | 8 |
| Totals | 53,446 | 467 |

d com-
on the
Mo.,
dio ap-
motives
acific's
Cal.,
uipped
us fur-
the fa-
mpany.
N. C.,
space
on 10
and at
Coast
and 1
e pro-
muni-
ata Fe
yards,
g one
d four

tugboats, and the other in Corwith yard, near Chicago, where one fixed station and 10 locomotives are equipped. In addition to radio yard communication already in service at New Castle, Pa., the Baltimore & Ohio installed Bendix equipment in one fixed station and two tugboats at Baltimore, Md.

During 1946 several manufacturers manifested either new or renewed interest in the railroad train communication field. The Farnsworth Television & Radio Corporation developed space radio apparatus especially for railroad service; ran extensive tests on the Detroit, Toledo & Ironton, the Nickel Plate and in various yards, as well as furnished equipment for a permanent installation on new passenger trains on the Pere Marquette, as discussed elsewhere in this article.



The Southern made extensive installations of talk-back loud-speakers in flat yards at Birmingham, Ala., and Atlanta, Ga.

Permanent Installations of Yard Communication Placed in Service During 1946

| Railroad | City | No. of Locomotives Equipped | No. of Fixed Stations | Space Radio or Inductive | Manu- facturer of Equipment | Frequency |
|---------------|---------------------------------------|-----------------------------|-----------------------|--------------------------|-----------------------------|---|
| A. T. & S. F. | Chicago, Corwith yard | 10 | 1 | Space | Bendix | 160.65 mc |
| | San Francisco, Cal. | 2 | 1 | Space | Bendix | 161.37 mc |
| | | 4* | | | | |
| B. & O. | Baltimore, Md. | 2* | 1 | Space | Bendix | 160.410 |
| C. & O. | Newport News, Va. | 2 | 1 | Inductive | U. S. & S. Co. | 151 kc |
| C. B. & Q. | Chicago | 22 | 1 | Space | Bendix | 159.690 mc |
| | Galesburg, Ill. | 8 | 2 | Inductive | U. S. & S. Co. | 5.7 kc |
| | | | | | | 7.7 kc |
| | Lincoln, Neb. | 4 | 1 | Inductive | U. S. & S. Co. | 5.7 kc |
| C. R. I. & P. | Armourdale, Kan. | 8 | 1 | Space | Sperry | |
| D. & R. G. W. | Denver, Colo. | 1 | 1 | Space | Bendix | 160.83 mc |
| | Alamosa, Colo. | 1 | 1 | Space | Space | 160.83 mc |
| F. E. C. | Miami, Fla. | 12 | 1 | Space | Communica- tions Co. | 160.11 mc |
| G. M. & O. | Meridian, Miss. | 2 | 1 | Space | Bendix | 159.03 mc |
| P. M. | Grand Rapids, Mich. | 1 | 1 | Space | Farnsworth | 161.49 mc |
| S. A. L. | Hamlet, N. C. | 10 | 2 | Space | Com. Co. | 159.33 mc |
| | | | | | | 160.17 mc |
| S. P. | San Francisco, Cal., Bayshore yard | 9 | † | Space | A. T. & T. | Operated thro telephone company facilities |
| U. P. | Kansas City, Mo. | 16 | 1 | Space | Motorola | 161.85 mc |

Legend:

* = on tug boats.

As a part of the exhibits by manufacturers at the convention of the Communications section in November, the General Railway Signal Company exhibited to the public, for the first time, apparatus of both the inductive and space radio types which this company developed in cooperation with the General Electric Company. The space radio was further developed with the aid of the New York Central in several yards, as well as on tug boats in New York harbor. Other developments have been made by the G. R. S. and G. E. companies in cooperation with the Missouri Pacific, which has a project under way on 193 miles of single track between McGehee, Ark., and Alexandria, La., including 15 locomotives, 15 cabooses and 7 wayside stations. Inductive apparatus is for operation between cabooses and wayside stations, and space radio between cabooses and locomotives.

The Western Electric in cooperation

with the Northern Pacific developed a system of space radio train communication and ran extensive tests during 1946 on the Northern Pacific, between Seattle, Wash., and Yakama, as well as between Seattle and Portland, Ore., as was explained in the *Railway Age* of September 1.

Another newcomer in train communication during 1946 was the Westinghouse Electric Corporation, which exhibited space radio apparatus for railroad service at the November convention of the Communications section. This apparatus has been and is being tested on the railroads.

The foregoing discussion of the improvements in communications apparatus and the progress of installations during 1946 leads to a conclusion that train communication has now developed to the point where it is accepted as rendering satisfactory service for the purpose intended. However the next

question on the part of many railroad managements may be with respect to the benefits to be accomplished by such forms of communication. This thought was expressed by C. L. Jellinghouse, vice-president of the New York Central, in an address at the recent convention of the Communications section, A. A. R., in which he said: "The application of radio on an ever-growing scale is a matter of time. Radio must justify itself, however, by providing more economical and efficient service in yard and road operations. I realize that it is one thing to show actual economy in so many dollars and cents, and another thing to justify its use purely on the assumption of increased efficiency, not measurable in money. Experiments are being conducted on both bases and we shall soon learn where installations can be made to best advantages."

Several articles published in the *Railway Age*, as well as reports by the Communications section, A. A. R., have given explanations of train time saved by train communication installations now in service. Furthermore, the Pennsylvania project will demonstrate the advantages on a heavy-traffic four-track main line, the Burlington and the Denver & Rio Grande installations will show what it can do on heavy-traffic single track in automatic-block-signal and centralized-traffic-control territories, and the New York Central installation will disclose its advantages on a medium-traffic single-track division with no signaling. Based on observations made on some of these roads, as well as on yard projects, the prediction is made here that within a relatively few years the major railroads will recognize the economic advantages of train communication and install such facilities as extensively as these roads now install and use other telephone equipment.

(Continued on page 98)

Construction of Signaling Was Stepped Up in 1946

Activity last year in the United States and Canada showed an increase of about 9.5 per cent, compared with that in 1945

By MAURICE PEACOCK

Associate Editor—Signals and Communications

Comparison of Annual Signaling Construction

| | 1946 | 1945 | 1944 | 1943 |
|--|--------|--------|-------|-------|
| Automatic Block Signals | 3,078 | 2,350 | 1,539 | 1,690 |
| Interlockings | | | | |
| Signals and switches at new plants | 1,529 | 910 | 851 | 1,498 |
| Signals and switches added at rebuilt plants | 993 | 940 | 687 | 760 |
| Signals and switches at automatic plants | 132 | 88 | 62 | 55 |
| Spring Switches | | | | |
| Spring buffer mechanisms | 554 | 764 | 382 | 448 |
| Mechanical facing-point locks | 248 | 341 | 115 | 88 |
| Signals at spring switches | 707 | 991 | 553 | 498 |
| Centralized Traffic Control | | | | |
| Power switch machines | 453 | 633 | 596 | 463 |
| Semi-automatic signals | 1,385 | 2,217 | 2,141 | 1,775 |
| Classification Yards | | | | |
| Car retarders | 18 | 14 | 25 | .. |
| Power switch machines | 73 | 57 | 52 | .. |
| Highway Crossing Protection | | | | |
| Protective units | 2,214 | 1,089 | 643 | 477 |
| Totals | 11,384 | 10,394 | 7,646 | 8,752 |

Spring Switches Installed During 1946

| Railroad | Classification as to Application | | | | | Total No. Equipped Signal Protection | | |
|----------------------|--|----------------------|---------------------|----------|------------|--------------------------------------|--------------|-------------|
| | Total No. of Spring Switches Installed | End of Passing Track | End of Double Track | Junction | Yard Track | With Facing-Point Lock | High Signals | Low Signals |
| A. & S. | 1 | .. | .. | .. | 1 | .. | 165 | 1 |
| A. T. & S. F. | 91 | 86 | .. | 1 | 4 | .. | 14 | 29 |
| A. & W. P. | 11 | 11 | .. | .. | .. | 11 | .. | .. |
| A. C. L. | 2 | 1 | .. | .. | 1 | 2 | .. | .. |
| B. & M. | 3 | 1 | .. | .. | 2 | .. | 1 | 3 |
| B. & O. | 11 | 10 | 1 | .. | .. | 1 | 8 | 19 |
| C. N. | 15 | 15 | .. | .. | .. | .. | 3 | 13 |
| C. P. | 1 | .. | .. | .. | 1 | 1 | 3 | .. |
| C. of G. | 25 | 24 | .. | .. | 1 | 24 | 8 | 3 |
| C. & O. | 9 | 9 | .. | .. | .. | 8 | .. | 1 |
| C. & E. I. | 2 | .. | 1 | .. | 1 | .. | 1 | .. |
| C. & I. M. | 1 | .. | .. | .. | 1 | .. | .. | 1 |
| C. & N. W. | 1 | .. | .. | .. | 1 | .. | .. | .. |
| C. B. & O. | 5 | 3 | .. | .. | 2 | 4 | 4 | .. |
| C. I. & L. | 3 | 3 | .. | .. | .. | 12 | .. | .. |
| C. M. St. P. & P. | 14 | 14 | .. | .. | .. | 12 | 23 | 3 |
| C. R. I. & P. | 3 | 1 | .. | 2 | .. | 2 | 5 | 4 |
| C. & S. | 4 | 1 | .. | .. | 3 | 4 | 2 | 4 |
| D. L. & W. | 3 | 1 | 2 | .. | .. | .. | 6 | .. |
| D. & R. G. W. | 7 | 7 | .. | .. | .. | 5 | 13 | 6 |
| E. J. & E. | 4 | 4 | .. | .. | .. | 1 | 4 | 2 |
| Erie | 2 | .. | 2 | .. | .. | 2 | 2 | .. |
| F. E. C. | 9 | 9 | .. | .. | .. | .. | .. | 10 |
| Georgia | 37 | 37 | .. | .. | .. | 37 | 6 | .. |
| G. N. | 67 | 53 | 1 | .. | 13 | 59 | 63 | 1 |
| I. C. | 52 | 51 | .. | 1 | .. | .. | 71 | 1 |
| L. & N. | 52 | 50 | 1 | 1* | .. | .. | .. | 13 |
| Me. C. | 1 | .. | .. | .. | 1 | .. | 2 | 1 |
| M. & St. L. | 2 | 2 | .. | .. | .. | 2 | 4 | 2 |
| M. St. P. & S. S. M. | 4 | 2 | 1 | 1 | .. | 4 | 5 | 4 |
| M-K-T | 13 | 13 | .. | .. | .. | .. | .. | 1 |
| M. P. | 8 | .. | 1 | .. | 7 | 6 | 6 | 5 |
| N. Y. C. | 1 | 1 | .. | .. | .. | 1 | 1 | .. |
| N. Y. O. & W. | 3 | .. | 3 | .. | .. | .. | 3 | .. |
| N. P. | 8 | 3 | 1 | 1 | 3 | 8 | 2 | 5 |
| Penna. | 3 | 3 | .. | .. | .. | 3 | 5 | .. |
| L. I. | 4 | .. | .. | .. | 4 | .. | .. | .. |
| St. L.-S. F. | 26 | 25 | .. | .. | 1 | 25 | 48 | .. |
| St. L. S. W. | 5 | 5 | .. | .. | .. | 5 | 5 | .. |
| S. A. L. | 5 | 5 | .. | .. | .. | 5 | 10 | .. |
| S. P. | 15 | 14 | .. | .. | 1 | 13 | 27 | 5 |
| T. & N. O. | 4 | 2 | 1 | 1* | .. | .. | .. | 3 |
| Southern | 4 | 4 | .. | .. | .. | .. | 8 | 4 |
| A. G. S. | 2 | 1 | 1 | .. | .. | .. | 4 | .. |
| G. S. & F. | 2 | 2 | .. | .. | .. | .. | 4 | 1 |
| S. P. & S. | 3 | 2 | .. | .. | 1 | 2 | 4 | 3 |
| T. & P. | 1 | 1 | .. | .. | .. | .. | 2 | 1 |
| U. P. | 3 | 3 | .. | .. | .. | .. | .. | 3 |
| Virginian | 1 | 1 | .. | .. | .. | 1 | 1 | .. |
| W. M. | 1 | .. | .. | .. | 1 | .. | .. | .. |
| Totals | 554 | 480 | 16 | 8 | 50 | 248 | 555 | 152 |

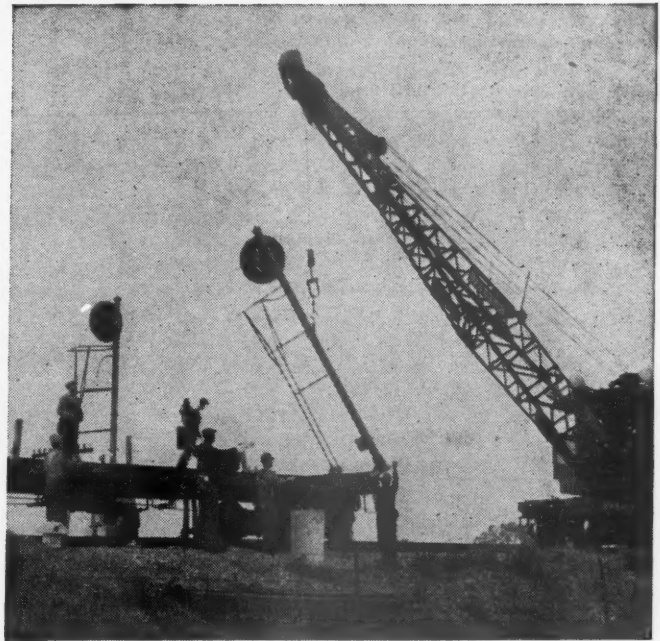
In "Junction" column: * = crossover.

DURING 1946, a total of 11,384 signaling units were installed on the railroads in the United States and Canada, bringing increases over 1945 in the construction of automatic block signaling, interlocking, classification yards and, particularly, highway crossing protection. These advances were made notwithstanding shortages of certain critical construction materials. On the other hand, decreases were witnessed in the number of installations of spring switches and centralized traffic control. The 1946 figure of 11,384 units represents an increase of 990 over the total of 10,394 units installed in 1945, or, in other words, an increase of about 9.5 per cent.

Automatic Block Increased

A total of 3,078 automatic block signals were installed last year, compared with 2,350 in 1945, representing an increase of 728 units, or 31 per cent. Of the total number of automatic signals, 3,002 were of the color-light type, 12 of the position-light type, and 64 of the semaphore type. Automatic block was installed on 2,412 road miles during 1946, compared with 1,791.3 road miles in 1945, an increase of 620.7 road miles. The 1946 road mileage figure included 2,743.4 miles of track, of which 2,110.4 miles was single track, 282.7 double track, 8 three track, and 10.9 four track.

Despite shortages of certain materials during 1946, signal construction in general increased, compared with 1945. While increases were shown in the construction of automatic block, interlocking and especially highway crossing protection, there were decreases in the installation of spring switches and centralized traffic control.



Captions read left to right

Cleaning the lens of a searchlight color-light signal prior to placing it in service

Masts with signals and ladders attached being set by a crane

Wiring an instrument case in the field for an automatic block signal installation

Signalmen operating a power-driven bonding drill and installing bonds



The Rock Island placed automatic block in service on 355.6 miles of single track between Narka, Kan., and Limon, Colo. On the Georgia, automatic block

was installed on 139.4 miles of single track and 3.7 miles of double track between Harlem, Ga., and Atlanta, while the International-Great Northern lines

of the Missouri Pacific placed automatic block in service on 115.5 miles of single track between Elkhart, Tex., and Spring.

The C. & O. installed automatic block

Centralized Traffic Control Completed in 1946

| Railroad | Location | Miles of Road | Direct Wire or Coded Control | No. of Levers | No. of Power Switches | No. of Signals | Manufacturer |
|-------------------|--------------------------------|---------------|------------------------------|---------------|-----------------------|----------------|--------------|
| A. T. & S. F. | Waynoka, Okla.-Canadian, Tex. | 109.6s | C | 95 | 39 | 117 | Union |
| B. & M. | Willows, Mass.-Ayer | 3.4d | C | 11 | 9 | 7 | Union |
| | Soapstone, Mass.-Williamstown | 11.7d | C | 36 | 24 | 32 | G.R.S. |
| | | 2.5t | | | | | |
| C. P. | Ogden, Alta.-Shepard | 1.4s | DW | 3 | .. | 7 | G.R.S. |
| | | 11.0d | | | | | |
| C. & O. | Strathmore, Va.-Greenway | 44.0s | C | 30 | 14 | 42 | Union |
| | Staunton, Va.-Clifton Forge | 55.0s | C | 60 | 26 | 84 | Union |
| | Lockwood, Ky.-Kise | 28.0s | C | 22 | 12 | 29 | Union |
| | | 1.7d | | | | | |
| | Richardson, Ky.-BU Cabin | 14.0s | C | 21 | 12 | 28 | Union |
| | | 2.0d | | | | | |
| C. B. & Q. | Flag Center, Ill.-Savanna | 57.0s | C | 29 | 14 | 57 | G.R.S. |
| | McCook, Neb.-Akron, Colo. | 143.0s | C | 60 | 30 | 120 | Union |
| C. M. St. P. & P. | Red Wing, Minn.-Duke | 5.8d | DW | 10 | 8 | 15 | Union |
| C. R. I. & P. | Ft. Worth, Tex.-Dallas | 31.6s | C | 36 | 10 | 43 | Union |
| | Caldwell, Kan.-Peck | 37.0s | C | 14 | 7 | 28 | Union |
| D. & H. | Nineveh, N. Y.-Harpurville | 3.5d | C | 16 | 12 | 32 | G.R.S. |
| D. & R. G. W. | Nolan, Utah-Kyune | 4.1s | C | 7 | 1 | 10 | G.R.S. |
| | Dotsero, Colo.-Gypsum | 5.2s | DW | 4 | .. | 4 | G.R.S. |
| | Dotsero, Colo.-Niche | 3.0s | DW | 4 | .. | 4 | G.R.S. |
| I. C. | Dawson Springs, Ky.-Scott | 9.0d | C | 11 | 4 | 21 | Union |
| L. & N. | Henderson, Ky.-Doyle | 32.0s | C | 19 | 8 | 25 | G.R.S. |
| | Sinks, Ky. | .. | | .. | 3 | 8 | Union |
| M. P. | Valley Jct., Ill.-No. Dupo | 4.0d | C | 13 | 10 | 14 | G.R.S. |
| N. Y. C. & St. L. | S. Whitley, Ind.-Claypool | 18.0s | C | 13 | 3 | 9 | Union |
| N. & W. | Elliston, Va.-Christiansburg | 11.8d | C | 41 | 26 | 56 | Union |
| | Bluestone Jct., W. Va. | 1.6d | DW | 17 | 12 | 31 | Union |
| | Bluff, Va.-Belspring | 1.1s | C | 12 | 12 | 21 | Union |
| | | 2.0d | | | | | |
| | Walton, Va.-Radford | 4.2d | DW | 18 | 6 | 20 | Union |
| | Pulaski, Va.-Bristol | 92.1s | DW-C | 92 | 41 | 171 | Union |
| P. M. | St. Joseph, Mich.-Porter, Ind. | 44.7s | C | 37 | 11 | 51 | G.R.S. |
| | | 3.9d | | | | | |
| S. A. L. | Waldo, Fla.-Hawthorne | 13.2s | C | 6 | 3 | 6 | Union |
| S. P. | Lucin, Utah-Lemay | 21.5s | C | .. | 11 | 44 | Union |
| T. & N. O. | Sherman, Tex.-Denison | 8.2s | DW | 6 | 1 | 12 | Union |
| T. & P. | Arispe, Tex.-Sierra Blanca | 4.9s | DW | 8 | 1 | 14 | G.R.S. |
| | Reisor, La.-Lucas | 10.6s | DW | 8 | .. | 13 | G.R.S. |
| U. P. | Pocatello, Idaho-Glenns Ferry | 122.5s | C | .. | 79 | 192 | Union |
| | | 34.1d | | | | | |
| Wabash | Huntsville, Mo.-Salisbury | 14.2s | C | 8 | 4 | 18 | Union |
| | | 915.9s | | 777 | 453 | 1,385 | |
| | | 109.7d | | | | | |
| | | 2.5t | | | | | |
| | Road Miles | 1,028.1 | | | | | |
| | Track Miles | 1,142.8 | | | | | |

Legend:
In "Miles of Road" column: s=single track; d=double track; t=three track.
In "Direct Wire or Coded Control" column: C=coded control; DW=direct wire control; DW-C=direct wire and coded control.

New and Rebuilt Interlockings, Including Additions, With Mechanical Locking Constructed in 1946

| Railroad | Location | No. of Operative Signal Units | No. of Switches or Derails Operated by | | | Manu- facturer |
|------------------------------|------------------------------|--|---|-------------------|--------------------------|-------------------|
| | | | Electric Machines | Electro-Pneumatic | Mechanical Connection | |
| NEW PLANTS | | | | | | |
| B. & O. | Washington Court House, Ohio | 6 | .. | .. | 6 | G.R.S. |
| | Girard Jct., Ohio | 4 | .. | .. | 2 | G.R.S. |
| | Powell, W. Va. | 5 | 1 | .. | 6 | G.R.S. |
| D. & R. G. W. | Dotsero, Colo. | 8 | .. | .. | 9 | G.R.S. |
| I. C. | Mt. Olive, Ill. | 2 | .. | .. | 5 | Union |
| | East Cabin, Ill. | 21 | 3 | .. | 9 | Union |
| | Milan, Tenn. | 4 | .. | .. | .. | Union |
| N. Y. Bd. of Transp. | Brooklyn, N. Y. | 36 | 16 | .. | .. | G.R.S. |
| N. Y. C. | Oscawanna, N. Y. | 5 | 1 | .. | .. | G.R.S. |
| | Croton, N. Y. | 4 | 2 | .. | .. | G.R.S. |
| | Philipse Manor, N. Y. | 8 | 2 | .. | .. | G.R.S. |
| | Thurston, Ohio | 9 | 2 | .. | .. | G.R.S. |
| N. Y. C. & St. L. | Frankfurt, Ind. | 7 | .. | .. | 8 | Union |
| | Buffalo, N. Y. | 4 | .. | .. | 2 | Union |
| N. P. | Peak, N. D. | 7 | .. | .. | 3 | G.R.S. |
| Penna. | Newark, N. J. | 2 | .. | .. | .. | Union |
| | Philadelphia, Pa. | 5 | .. | .. | .. | Union |
| | Elliott, Pa. | 3 | 1 | .. | .. | Union |
| | Wellesville, Ohio | 6 | .. | 3 | .. | Union |
| | Belleville, Ohio | 20 | 8 | .. | .. | Union |
| | Columbus, Ohio | 6 | 2 | .. | .. | Union |
| Reading | Perkasie, Pa. | 4 | .. | .. | .. | Union |
| S. A. L. | Lacoochee, Fla. | 6 | .. | .. | .. | Union |
| | Yulee, Fla. | 6 | .. | .. | .. | Union |
| W. M. | Big Pool Jct., Md. | 10 | .. | 5 | .. | Union |
| REBUILT PLANTS AND ADDITIONS | | | | | | |
| A. T. & S. F. | Carrollton Jct., Mo. | 9 | 4 | .. | .. | G.R.S. |
| | Camden Jct., Mo. | 9 | 8 | .. | .. | G.R.S. |
| B. & O. | Poplar, Md. | 9 | .. | .. | 20 | G.R.S. |
| | Etna, Pa. | 7 | .. | .. | 12 | G.R.S. |
| | Aberdeen, Md. | 10 | .. | .. | 24 | G.R.S. |
| | Carlisle, Ohio | 6 | .. | .. | 28 | G.R.S. |

Table continued on next page

between Hitchins, Ky., and Winchester, on 79 miles of single track, and the Santa Fe made an installation of 77 miles of single track between Brownwood, Tex., and Buffalo Gap. The Great Northern made an installation on 73.2 miles of single track between Fargo Jct., N. D., and PA tower, and also on 62.6 miles of single track between Lyndale Jct., Minn., and St. Cloud.

Additional Installations

The Milwaukee installed controlled automatic block signals on 77 miles of single track between Aberdeen, S. D., and Selby, and also between Mobridge, S. D., and McLaughlin on 30.5 miles of single track. In the Milwaukee installations the wayside signals at the

Automatic Interlockings Installed in 1946

| Railroad | Location | No. of Signals | Manufacturer |
|-------------------|--|----------------|--------------|
| A. T. & S. F. | Caney, Kan. | 4 | Union |
| C. N. | Matsqui, B. C. (Electrically-operated approach signals) | 2 | Union |
| | Chilliwack, B. C. (Electrically-operated approach signals) | 1 | G.R.S. |
| | Nutana Jct., Sask. (Non-interlocked junction protection signals) | 11 | G.R.S. |
| C. & N. W. | Triumph, Minn. | 4 | G.R.S. |
| | Fairmont, Minn. | 6 | G.R.S. |
| C. G. W. | Taopi, Minn. | 8 | Union |
| C. M. St. P. & P. | Linton, Ind. | 4 | Union |
| | Monterey, Minn. (Electrically-locked gates and signals) | .. | Union |
| C. R. I. & P. | Belknap, Iowa | 6 | Union |
| | Centerville, Iowa | 8 | Union |
| G. N. | Tobacco, Mont. (Semi-automatic including 1 switch machine) | 4 | G.R.S. |
| G. B. & W. | New London, Wis. | 4 | .. |
| I. T. | Federal-Wood River, Ill. | 4 | .. |
| M. P. | Marlin, Tex. | 10 | G.R.S. |
| N. C. & St. L. | Jackson, Tenn. | 7 | Union |
| N. Y. C. | Central Square, N. Y. | 12 | G.R.S. |
| St. L.-S. F. | Ashdown, Ark. | 4 | Union |
| St. L. S. W. | Pittsburgh, Tex. | 6 | Union |
| | North Little Rock, Ark. (Electrically-locked pipe-connected derails on St. L. S. W. and home signals on C. R. I. & P.) | 4 | Union |
| S. A. L. | St. Catherine, Fla. | 8 | Union |
| T. & P. | Shreveport, La. | 5 | G.R.S. |
| W. P. | Oakland, Cal. | 6 | Union |
| W. & L. E. | Clyde, Ohio | 4 | Union |
| Total | | 132 | |

ends of passing tracks are under the control of dispatchers, and trains are governed by signal indications, the switches being hand-operated.

The Katy installed automatic block with color-light signals on 53.3 miles of double track between Stringtown, Okla.,

Manchester,
and the
on of 77
Brown-
p. The
lation on
en Fargo
also on
een Lyn-

ns

controlled
miles of
S. D.,
obridge,
5 miles
ukee in-
at the

f Manu-
fac-
turer
Union

Union

G.R.S.

G.R.S.

G.R.S.

G.R.S.

Union

Union

Union

Union

G.R.S.

.....

.....

G.R.S.

Union

G.R.S.

Union

Union

Union

Union

G.R.S.

Union

Union

Union

er the

ns are

s, the

block

miles of

Okla.,

4, 1947

and Staley, replacing 24 semaphore signals in that territory. The Boston & Maine installed new automatic block on 27.8 miles of double track and 2.5 miles of three track between Soapstone, Mass., and Hoosick Jct., N. Y., in connection with the discontinuance of electrification through the Hoosac tunnel. The Missouri Pacific replaced semaphores on 30 miles of single track and 5 miles of double track between St. Louis, Mo., and De Soto. Other roads to replace semaphores in automatic block territory included the New York Central, Reading, Union Pacific and New Haven.

In Canada the Canadian Pacific installed automatic block on 115.3 miles of single track between Smith Falls, Ont., and Chalk River, and also on 116 miles of single track between Calgary, Alta., and Lake Louise, these being the largest automatic block installations in Canada during 1946. The Canadian National placed automatic block signals in service between St. Hubert, Que., and St. Hyacinthe on 25.6 miles of double track.

More Interlocking

Increases were shown in interlocking last year, a total of 1,529 signals and switches being installed at new interlockings, compared with 910 in 1945. This represents an increase of 619 units, or 68 per cent. Signals and switches at rebuilt plants totaled 993 in 1946, representing an increase of 53 units over the 1945 figure of 940. In 1946 a total of 821 operative signal units, 351 electric switch machines and 63 electro-pneumatic switch machines were installed by 31 railroads at 78 all-relay interlockings. By contrast, in 1945 a total of 523 operative signal units, 171 electric switch machines and 23 electro-pneumatic switch machines were installed by 23 railroads at 65 new all-relay plants.

The New York Central installed an all-relay plant at Depew, N. Y., which includes 49 operative signal units and 23 electric switch machines, while the Southern installed a plant at Chattanooga, Tenn., with 35 operative signal units and 30 electric switch machines. The New Haven installed a plant with 34 operative signal units and 30 electric switch machines at Providence, R. I., while the Pennsylvania placed a plant in service at Crestline, Ohio, with 30 operative signal units and 23 electric switch machines.

All-Relay Installations

At Lincoln, Neb., the Burlington installed a project with 29 operative units and 15 electric switch machines, and the Delaware & Hudson placed an installation in service at Mechanicville, N. Y.,

| Railroad | Location | No. of Operative Signal Units | No. of Switches or Derails Operated by | | | Manu- facturer |
|----------------------|--|--|---|-----------------------|--------------------------|-------------------|
| | | | Electric Machines | Electro- Pneumatic | Mechanical Connection | |
| B. & M. | Ayer, Mass. | 15 | .. | 6 | .. | Union |
| | Manchester, Mass. | 8 | .. | .. | .. | G.R.S. |
| | Gloucester, Mass. | 8 | .. | .. | .. | G.R.S. |
| | Somerville, Mass. | | | | | |
| | (Replacement of Machine—due to fire)..... | | .. | .. | .. | Union |
| C. of N. J. | Jersey City, N. J. | | | | | |
| | (Replacement of worn machine)... | .. | .. | .. | .. | Union |
| C. & O. | Hinton, W. Va. | 9 | 1 | 8 | .. | Union |
| | Meadow Creek, W. Va. | 5 | 3 | .. | .. | Union |
| | Macdonald, W. Va. | .. | 2 | .. | .. | Union |
| | Huntington, W. Va. | 16 | 10 | .. | .. | Union |
| | Losantville, Ind. | 1 | .. | .. | 2 | Union |
| | Drew, Ind. | 1 | .. | .. | 1 | Union |
| | Kewanna, Ind. | 1 | .. | .. | 2 | Union |
| | North Judson, Ind. | 1 | 2 | .. | .. | Union |
| C. & W. I. | State Line-Hammond, Ind. | 48 | .. | .. | 55 | Union |
| D. L. & W. | Morristown, N. J. | 6 | .. | .. | .. | Union |
| D. & R. G. W. | South Denver, Colo. | 14 | .. | .. | 28 | G.R.S. |
| L. & N. | East St. Louis, Ill. | 8 | .. | .. | .. | G.R.S. |
| M. St. P. & S. S. M. | Oshkosh, Wis. | 14 | 4 | .. | .. | G.R.S. |
| M. P. | | | | | | |
| I.-G. N. | McNeil, Tex. | 6 | .. | .. | 2 | G.R.S. |
| | Taylor, Tex. | 20 | .. | .. | 11 | G.R.S. |
| | Conroe, Tex. | 6 | .. | .. | 3 | G.R.S. |
| | Austin, Tex. | 14 | .. | .. | 3 | G.R.S. |
| N. Y. Bd. of Transp. | Brooklyn, N. Y. | 8 | .. | .. | .. | G.R.S. |
| N. Y. C. | | | | | | |
| M. C. | Detroit, Mich. | | | | | |
| | (Semaphore replaced by color- light signals; track functions un- changed)..... | 50 | .. | .. | .. | G.R.S. |
| N. & W. | South Norfolk, Va. | 2 | 1 | .. | 1 | Union |
| P. E. | Watts, Cal. | 6 | 14 | .. | .. | G.R.S. |
| Penna. | Rockville, Ohio | 5 | .. | 3 | .. | Union |
| | Rochester, Pa. | 14 | 19 | .. | .. | G.R.S. |
| | Leetonia, Ohio | 9 | .. | 2 | 7 | Union |
| | Mansfield, Ohio | 15 | .. | 7 | 4 | Union |
| | Mansfield, Ohio | 15 | .. | 7 | 4 | Union |
| | Pittsburgh, Pa. | 9 | .. | 6 | .. | Union |
| | North Judson, Ind. | 2 | 1 | .. | .. | Union |
| | Kewanna, Ind. | 3 | .. | .. | 2 | Union |
| | New Washington, Ohio | 3 | .. | .. | .. | Union |
| | New Paris, Ohio | 3 | 1 | .. | .. | Union |
| P. M. | Saginaw, Mich. | 14 | .. | .. | 26 | ..... |
| | Grand Rapids, Mich. | 11 | .. | .. | 20 | ..... |
| Reading | Birdsboro, Pa. | 19 | .. | .. | 25 | Union |
| | Reading, Pa. | 26 | .. | .. | 16 | Union |
| | Milton, Pa. | 18 | .. | .. | 17 | Union |
| | Lewisburg, Pa. | 8 | .. | .. | 5 | Union |
| | Lofty, Pa. | 7 | .. | .. | 3 | Union |
| | Annaville, Pa. | 5 | .. | .. | 2 | Union |
| | Sinking Spring, Pa. | 10 | .. | .. | 4 | Union |
| | Alburtis, Pa. | | | | | |
| | (Semaphores replaced by color- light signals at all locations; track functions unchanged)..... | 11 | .. | .. | 8 | Union |
| S. A. L. | Bonsal, N. C. | 2 | .. | .. | .. | Union |
| | St. Mary's River, Ga. | 2 | .. | .. | .. | Union |
| | Caloosahatchie, Fla. | 2 | .. | .. | .. | Union |
| | Big Manatel, Fla. | 2 | .. | .. | .. | Union |
| | Ashley River, S. C. | 2 | .. | .. | .. | Union |
| | Miami Canal, Fla. | 2 | .. | .. | .. | Union |
| S. P. | | | | | | |
| T. & N. O. | Crowley, La. | 6 | .. | .. | 2 | Union |
| Wabash | Birmingham, Mo. | 4 | 1 | .. | .. | Union |
| | Total New Plants..... | 198 | 38 | 8 | 50 | |
| | Total Rebuilt Plants and Additions | 546 | 71 | 39 | 337 | |

Car Retarder Projects Placed in Service During 1946

| Railroad Yard | No. of Tracks | No. of Retarders | Rail Feet Retarders | No. of Switches | No. of Track Circuits | Skates | No. of Towers and Control Machines | Manu- facturer |
|--|------------------|---------------------|------------------------|--------------------|-----------------------------|--------|--|-------------------|
| Penna., westbound yard, Pitcairn, Pa. | 41 | 18 | 1,239 | 43 | 43 | 30 | 3 | Union |

with 26 operative signal units and 19 electric machines. The Santa Fe placed a plant in service at Canadian, Tex., with 24 operative signal units and 12 electric machines, and the R. F. & P. installed an all-relay plant at Fredericksburg, Va., with 13 operative signal units and 11 electro-pneumatic switch ma-

chines. In Canada the Canadian National installed six plants in Quebec and Ontario, ranging from 4 to 12 operative signal units and 1 to 2 electric switch machines.

As regards new interlockings, with mechanical locking between levers, a total of 11 roads installed 25 new plants

Highway-Railroad Grade Crossing Protection Installed During 1946

| Railroad | No. of Crossings | Total No. of Protective Units | No. of Wig-Wag Signals | No. of Flashing-Light Signals | No. of Rotating Disk Stop Sign Signals | No. of Traffic Type Stop-and-Go Crossing Signals | No. of Electrically-Operated Gates |
|----------------------|------------------|-------------------------------|------------------------|-------------------------------|--|--|------------------------------------|
| A. & S. | 1 | 2 | .. | 2 | .. | .. | .. |
| Alton | 3 | 10 | .. | 6 | .. | .. | 4 |
| A. T. & S. F. | 32 | 57 | 10 | 47 | .. | .. | .. |
| A. & St. A. B. | 1 | 3 | .. | 3 | .. | .. | .. |
| A. C. L. | 1 | 4 | .. | 4 | .. | .. | .. |
| B. & M. | 9 | 33 | .. | 18 | .. | .. | 15 |
| B. & O. | 25 | 65 | .. | 55 | .. | .. | 10 |
| C. N. | 11 | 21 | 1 | 20 | .. | .. | .. |
| C. P. | 18 | 38 | .. | 36 | .. | .. | 2 |
| C. of G. | 2 | 2 | .. | 2 | .. | .. | .. |
| C. R. R. of N. J. | 1 | 2 | .. | 2 | .. | .. | .. |
| C. & O. | 11 | 24 | .. | 24 | .. | .. | 2 |
| C. & E. I. | 2 | 7 | .. | 9 | 10 | .. | 6 |
| C. & N. W. | 16 | 36 | 11 | 2 | .. | .. | .. |
| C. G. W. | 8 | 15 | .. | 10 | 13 | .. | .. |
| C. I. & L. | 10 | 31 | .. | 18 | .. | .. | 4 |
| C. M. St. P. & P. | 13 | 31 | 9 | 18 | .. | .. | .. |
| C. N. S. & M. | 32 | 4 | .. | 4 | .. | .. | 45 |
| C. R. I. & P. | 32 | 299 | .. | 254 | .. | .. | 6 |
| C. S. S. & S. B. | 9 | 24 | .. | 18 | .. | .. | 12 |
| D. & H. | 8 | 33 | .. | 21 | .. | .. | 20 |
| D. L. & W. | 9 | 65 | .. | 45 | .. | .. | .. |
| D. & R. G. W. | 1 | 2 | .. | 2 | .. | .. | .. |
| D. T. & I. | 2 | 5 | .. | 5 | .. | .. | 2 |
| E. J. & E. | 1 | 4 | .. | 2 | .. | .. | 7 |
| Erie | 14 | 36 | .. | 29 | .. | .. | 4 |
| F. E. C. | 4 | 12 | .. | 8 | .. | .. | .. |
| Georgia | 1 | 6 | .. | 6 | .. | .. | 36 |
| G. T. W. | 20 | 76 | .. | 40 | .. | .. | 2 |
| G. N. | 29 | 58 | .. | 2 | 56 | .. | .. |
| I. C. | 12 | 58 | .. | 56 | .. | .. | 13 |
| I. H. B. | 2 | 14 | .. | 6 | .. | 8 | 16 |
| L. & N. E. | 4 | 9 | .. | 9 | .. | .. | .. |
| L. V. | 6 | 25 | .. | 12 | .. | .. | .. |
| L. & N. | 34 | 78 | .. | 62 | .. | .. | .. |
| M. C. | 6 | 12 | .. | 12 | .. | .. | .. |
| M. & St. L. | 1 | 2 | .. | 2 | 2 | .. | .. |
| M. St. P. & S. S. M. | 4 | 8 | 2 | 2 | 4 | .. | .. |
| M-K-T | 1 | 4 | .. | 2 | .. | .. | 2 |
| M. P. | 13 | 43 | .. | 37 | .. | .. | 6 |
| G. C. L. | 7 | 14 | .. | 12 | .. | .. | 2 |
| L-G-N. | 83 | 15 | .. | 13 | .. | 2 | 37 |
| N. Y. C. | 10 | 199 | .. | 162 | .. | .. | 6 |
| N. Y. C. & St. L. | 17 | 26 | .. | 20 | .. | .. | 2 |
| N. Y. N. H. & H. | 6 | 39 | .. | 37 | .. | .. | .. |
| N. Y. O. & W. | 4 | 6 | 6 | 6 | .. | .. | 2 |
| N. & W. | 20 | 38 | .. | 26 | 12 | .. | .. |
| N. P. | 16 | 23 | 13 | 10 | .. | .. | 103 |
| P. E. | 77 | 178 | .. | 71 | .. | 4 | 4 |
| P. M. | 12 | 30 | .. | 26 | .. | .. | .. |
| Reading | 3 | 5 | .. | 5 | .. | .. | .. |
| St. L.-S. F. | 11 | 25 | .. | 25 | .. | .. | .. |
| St. L. S. W. | 4 | 8 | .. | 8 | .. | .. | .. |
| S. D. & A. E. | 2 | 4 | .. | 4 | .. | .. | .. |
| S. A. L. | 15 | 30 | .. | 30 | .. | .. | .. |
| S. P. | 18 | 38 | 6 | 28 | .. | .. | .. |
| T. & N. O. | 3 | 8 | .. | 6 | .. | .. | 2 |
| Southern | 54 | 140 | .. | 132 | .. | .. | 8 |
| A. G. S. | 10 | 31 | .. | 31 | .. | .. | .. |
| C. N. O. & T. P. | 1 | 4 | .. | 2 | .. | .. | 2 |
| St. J. R. T. Co. | 3 | 7 | .. | 7 | .. | .. | .. |
| T. C. | 2 | 8 | .. | 4 | 2 | 2 | .. |
| T. & P. | 1 | 2 | .. | 2 | .. | .. | .. |
| U. P. | 8 | 18 | .. | 16 | .. | .. | 2 |
| Wabash | 13 | 46 | .. | 25 | .. | .. | 21 |
| W. M. | 2 | 4 | .. | 4 | .. | .. | .. |
| W. P. | 4 | 9 | 1 | 6 | 2 | .. | .. |
| W. & L. E. | 8 | 14 | .. | 14 | .. | .. | .. |
| Totals | 800 | 2,214 | 59 | 1,629 | 101 | 16 | 409 |

New Automatic Block Signaling Placed in Service During 1946

| Railroad | Location | Miles of Road | No. of Signals | Manu-fac-turer |
|---------------|--------------------------------------|---------------|----------------|----------------|
| Alton | Ft. Wayne Jct., Ill.-Brighton Park | 3.4s | 14c | G.R.S. |
| A. T. & S. F. | Arcadia, Cal.-Pasadena | 6.8d | 19c | Union |
| Ban. & Ar. | Brownwood, Tex.-Buffalo Gap | 7.5s | 133c | Union |
| B. & M. | Millinocket, Me.-West Seboois | 77.0s | 38c | G.R.S. |
| | Soapstone, Mass.-Hoosick Jct., N. Y. | 16.1s | .. | .. |
| | (Part of C.T.C. installation) | 27.8d | 50c | G.R.S. |
| | Beverly, Mass.-Gloucester | 2.5t | .. | .. |
| C. N. | St. Hubert, Que.-St. Hyacinthe | 11.3d | 16c | G.R.S. |
| C. P. | Smith Falls, Ont.-Chalk River | 25.6d | 21c | Union |
| | Boundary, Me.-Blair | 115.3s | 188c | Union |
| | Calgary, Alta.-Lake Louis | 30.9s | 39c | G.R.S. |
| | Pitt River Bridge, B. C.-Vancouver | 116.0s | 144c | G.R.S. |
| | Clanwilliam, B. C.-Revelstoke | 20.5d | 24c | G.R.S. |
| | Pine, Man.-Vermilion Bay | 6.0s | 4c | G.R.S. |
| | Rugby, Man.-Woodman | 1.0d | .. | .. |
| | | 23.5s | 9c | G.R.S. |
| | | 5.5d | 6s | .. |
| C. of G. | Hope, Ga.-Columbus | 59.0s | 64c | G.R.S. |
| C. & O. | Kise, Ky.-Richardson | 1.0d | 2s | Union |
| C. & N. W. | Hitchins, Ky.-Winchester | 4.3d | 3c | .. |
| | Rosemere, Wis.-Tavil | 79.0s | 143c | Union |
| | | 35.0s | 39s | G.R.S. |

Table continued on next page

of this type in 1946, compared with 11 roads and 20 installations the year previous. There were 198 operative signal units in 1946, compared with 127 the year previous; 38 electric switch machines, compared with 26 the year before; and 50 switches and derails operated by mechanical connection, compared with 12 in 1945.

The New York Board of Transportation installed a new plant at Brooklyn, N. Y., with 36 operative signal units and 16 electric switch machines, while the Illinois Central made an installation at East Cabin, Ill., with 21 operative signal units and 3 electric switch machines. The Pennsylvania, at Bellevue, Ohio, installed a plant with 20 operative signal units and 8 electric switch machines.

A total of 21 roads rebuilt or made additions to 60 plants of the same type, compared to 20 roads and 48 installations in 1945. At these plants there were 546 operative signal units, 71 electric switch machines, 39 electro-pneumatic machines and 337 mechanically connected switches and derails. By comparison, 382 operative signal units, 38 electric switch machines, 47 electro-pneumatic switch machines and 206 switches and derails operated by mechanical connection, were involved in the plants rebuilt or enlarged in 1945.

Automatic Interlocking

A total of 18 railroads installed 24 automatic interlockings last year, which included 132 signals, compared with 88 in 1945, an increase of 44 units, or 50 per cent. The Canadian National made installations at Matsqui, B. C., and Chilliwack, with electrically-operated approach signals, and also another installation at Nutana Jct., Sask., with non-interlocked junction protection signals.

The Milwaukee made an installation at Monterey, Minn., with electrically-locked gates and signals, while the Great Northern installed semi-automatic signals, together with a power switch machine at Tobacco, Mont. The Cotton Belt made an installation at a crossing with the Rock Island in North Little Rock, Ark., including derails with electric locks on the Cotton Belt track and home signals on the Rock Island.

Spring Switches Down

A total of 554 spring switches were installed by 44 railroads during 1946, compared with 764 in 1945, representing a decrease of 210 units, or 27 per cent. Mechanical facing-point locks were installed on 248 spring switches, compared with 341 in 1945, a decrease of 93 units. A total of 707 signals were

with 11
year pre-
ve signal
127 the
itch ma-
year be-
derails
nnection,
ansporta-
Brooklyn,
ual units
es, while
installa-
operative
switch
at Belle-
h 20 op-
c switch
or made
me type,
installa-
ere were
electric
neumatic
ly con-
By com-
units, 38
electro-
nd 206
by me-
olved in
1945.
ag
alled 24
e, which
with 88
s, or 50
al made
C., and
operated
her in-
t., with
tection
allation
trically-
ile the
omatic
switch
Cotton
rossing
a Little
s with
t track
Island.
n
s were
g 1946,
sents
er cent.
ere in-
com-
ease of
s were
4, 1947

installed at spring switches, which is a decrease of 284 units below the 1945 figure of 991 signals. Of the 554 spring switches placed in service last year, 480 were at ends of passing tracks, 16 at ends of double track, 8 at junctions and 50 were on yard tracks. The 707 signals installed included 555 high signals and 152 dwarf signals.

Sizable spring-switch installations included 91 on the Santa Fe, 67 on the Great Northern, 52 each on the Illinois Central and Louisville & Nashville, 37 on the Georgia, 26 on the Frisco and 25 on the Central of Georgia. The Canadian National installed 15 spring switches.

Centralized Traffic Control

During 1946 a total of 35 centralized traffic control projects were placed in service by 20 railroads on 1,028.1 road miles, including 915.9 miles of single track, 109.7 miles of double track and 2.5 miles of three track, totaling 1,142.8 track miles. During the year previous, C. T. C. was installed on 1,657.7 road miles, including 1,581.8 miles of single track and 75.9 miles of double track, totaling 1,733.6 track miles. Last year a total of 777 C. T. C. levers were installed, compared with 1,252 in 1945, a decrease of 475, or 38 per cent. Power switch machines on C. T. C. projects dropped from 633 units in 1945 to 453 in 1946, a decrease of 180 units, or 28 per cent. The number of semi-automatic signals decreased 832 units from 2,217 in 1945 to 1,385 units last year.

The largest installations last year included 143 miles of single track on the Burlington between McCook, Neb., and Akron, Colo.; 122.5 miles of single track and 34.1 miles of double track on the Union Pacific between Pocatello, Idaho, and Glens Ferry; 109.6 miles of single track on the Santa Fe between Waynoka, Okla., and Canadian, Tex.; and 92.1 miles of single track on the Norfolk & Western between Pulaski, Va., and Bristol.

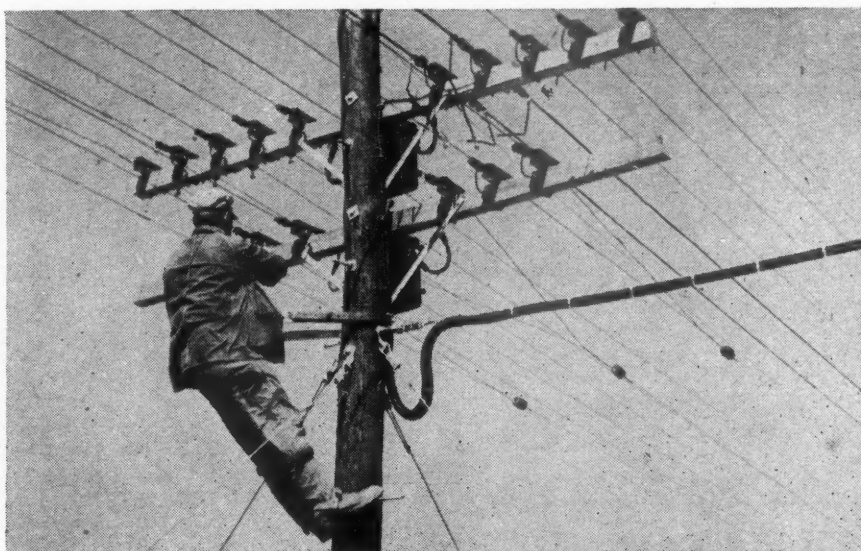
The Boston & Maine installed C. T. C. on 11.7 miles of double track and 2.5 miles of three track between Soapstone, Mass., and Williamstown, in connection with the discontinuance of electrification in the Hoosac tunnel. The only C. T. C. completed in Canada was on 1.4 miles of single track and 11 miles of double track on the Canadian Pacific between Ogden, Alta., and Shepard.

Car Retarders

In 1946 there was but one car retarder installation, namely, on the Pennsylvania, in the westbound yard at Pitcairn, Pa. This installation involved 18 retarders, compared with 14 the year

| Railroad | Location | Miles of Road | No. of Signals | Manu- fac- turer |
|----------------------|---|---------------|----------------|------------------------|
| C. M. St. P. & P. | Aberdeen, S. D.-Selby (Controlled automatic block) | 77.0a | 110c | Union |
| | Mobridge, S. D.-McLaughlin (Controlled automatic block) | 30.5a | 38c | Union |
| | Hettinger, N. D.-Rhame | 52.5a | 44c | Union |
| C. R. I. & P. | Eldon, Iowa-Centerville | 38.4a | 40c | Union |
| | Chico, Tex.-Saginaw | 43.5a | 45c | Union |
| | Narka, Kan.-Limon, Colo. | 355.6a | 357c | Union |
| D. L. & W. | Netcong, N. J.-Washington | 19.2a | 17a | Union |
| E. J. & E. | Ingallton, Ill. | 1.2a | 1c | G.R.S. |
| | Brisbane, Ill. (On one track of double track) | 2.5a | 2c | G.R.S. |
| | Hobart, Ind. | 1.6a | 6c | Union |
| Erie | Hammond, Ind.-State Line, Ind./Ill. | 1.5d | s | G.R.S. |
| F. E. C. | New Smyrna Beach, Fla. | ... | 1c | G.R.S. |
| Georgia | Harlem, Ga.-Atlanta | 139.4a | 188c | Union |
| | ... | 3.7d | ... | ... |
| G. N. | Lyndale Jct., Minn.-St. Cloud | 62.6a | 85c | G.R.S. |
| | Minneapolis, Minn.-Northtown | 3.7a | 18c | G.R.S. |
| | Fargo Jct., N. D.-PA Tower | 73.2a | 101c | G.R.S. |
| I. C. | Pinckneyville, Ill.-DuQuoin | 7.8a | 8c | Union |
| | Woodstock, Tenn.-Leewood | 7.5d | 9c | Union |
| K. C. T. | K. C. Union Sta., Mo.-Sheffield | 3.9f | 24c | Union |
| L. & H. R. | Pequest, N. J.-Andover | 17.6a | 22c | G.R.S. |
| L. & N. | Henderson, Ky.-Doyle | 32.0a | 45c | G.R.S. |
| | N. Corbin Yd., Ky.-S. Corbin Yd. | 0.5d | 4c | G.R.S. |
| M. St. P. & S. S. M. | Valley Siding, Wis.-Fond du Lac | 3.1a | 18c | G.R.S. |
| M-K-T | Stringtown, Okla.-Staley (Replaced 24 semaphore signals) | 53.3d | 59c | Union |
| | Sargent (Dallas), Tex.-Waxahachie | 29.9a | 40c | Union |
| M. P. | Rich Hill, Mo.-Nevada | 16.0a | 21c | G.R.S. |
| | St. Louis, Mo.-De Soto (Replacement of semaphore signals) | 5.0d | 47c | G.R.S. |
| | ... | 30.0a | ... | ... |
| I-G. N. | Elkhart, Tex.-Spring | 115.5a | 140c | G.R.S. |
| N. Y. Bd. of Transp. | Brooklyn, N. Y.-Fulton St. Line | 2.0d | 30c | G.R.S. |
| | New York, Pelham Line | 4.4a | 6c | Union |
| N. Y. C. & St. L. | Donnellson, Ill.-Sorento | 10.0a | 13c | Union |
| N. Y. C. | Albany, N. Y.-Schenectady (Replacement of semaphore signals) | 5.0f | 42c | G.R.S. |
| | ... | 5.5d | ... | ... |
| | ... | 5.5t | ... | ... |
| | Depew, N. Y.-Lancaster (Replacement of semaphore signals) | 2.0 | 6c | G.R.S. |
| C. C. C. & St. L. | Edison, Ohio-Worthington | 38.2a | 36c | G.R.S. |
| M. C. | Jackson, Mich.-Rives Jct. (Replacement of semaphore signals) | 0.1a | 24c | G.R.S. |
| | ... | 10.0d | ... | ... |
| P. & L. E. | Lowellville Jct., Ohio-Robinson, Pa. (In four-track territory) | 3.1a | 2c | Union |
| N. Y. N. H. & H. | Cedar Hill, Conn.-Meriden (Replacement of semaphore signals) | 14.2d | 23c | G.R.S. |
| | Cranston, R. I.-Providence (Replacement of old signals) | 2.7d | 5c | Union |
| Penna. | Newark, N. J. | 1.8d | 4p | Union |
| | Philadelphia, Pa. | 3.9d | 4p | Union |
| L. I. | Floral Park, N. Y.-Garden City | 3.5d | 4p | Union |
| Reading | Milton, Pa.-Pottsgrove | 3.7d | 2c | G.R.S. |
| | Sellersville, Pa.-Coopersburg (Replacement of disk signals) | 12.2d | 17c | G.R.S. |
| | Palmyra, Pa. (Three-track territory; signals replaced on two tracks) | 1.3d | 4c | G.R.S. |
| | Palmyra, Pa.-Annville (Two-track territory; signals replaced on one track) | 4.1d | 2c | G.R.S. |

Table continued on next page



Signalman making line taps on new pole line for signaling installation

| Railroad | Location | Miles of Road | No. of Signals | Manufacturer |
|------------------|---|---------------|----------------|--------------|
| Reading (Cont'd) | Annapolis, Pa.-Lebanon (Three-track territory; signals replaced on two tracks) | 3.2d | 4c | G.R.S. |
| | Sinking Spring, Pa.-Wyomissing Jct. (Two-track territory; signals replaced on one track) | 2.5d | 2c | Union |
| St. L. S. F. | Wetumka, Okla.-Ada | 43.8s | 63c | Union |
| St. L. S. W. | Townley, Mo.-Bracy, Ark. | 7.3d | 17c | Union |
| S. A. L. | North Altheimer, Ark.-S. Altheimer | 4.5s | 8c | Union |
| | Marston, N. C.-Aberdeen (Two-track territory; existing single track signals replaced) | 14.1s | c | Union |
| Southern | Sheffield Jct., Ala.-Furnace Jct. | 3.0s | 6c | .... |
| S. P. | | | | |
| T. & N. O. | Lufkin, Tex.-Nacogdoches | 19.0s | 24c | Union |
| | Dorr Jct., Tex.-Haywood Jct. | 2.0s | 4c | Union |
| | Sherman, Tex.-Denison | 9.0s | 4c | Union |
| S. P. & S. | McLoughlin, Wash.-Mt. Pleasant | 17.0s | 24c | G.R.S. |
| | North Bonneville, Wash.-Stevenson | 9.0s | 8c | G.R.S. |
| | North Dalles, Wash.-Maryhill | 26.0s | 23c | G.R.S. |
| | Cliffs, Wash.-Hover | 66.0s | 50c | G.R.S. |
| | Finley, Wash.-Kennewick | 6.0s | 7c | G.R.S. |
| | Martindale, Wash.-Overlook | 64.0s | 52c | G.R.S. |
| U. P. | Weiser, Idaho | 1.2s | 2c | Union |
| | Caliente, Nev.-Tomas, Utah (Replacement of semaphore signals) | 36.4s | 38c | Union |
| | North Platte, Neb. | 1.2d | 3c | Union |
| | Laramie, Wyo. | 1.1d | 3c | Union |
| | Green River, Wyo. | 0.6d | 2c | Union |
| | Topeka, Kan. | 1.4d | 3c | Union |
| Virginian | Norfolk, Va. | 3.7s | 7c | G.R.S. |
| | | 2.2d | | |
| W. M. | Brandon, Pa.-Conboy | 7.0d | 11c | Union |
| | Hagerstown, Md.-Wayneville, Pa. | 9.0d | 12c | Union |
| | WF, Md.-Big Spring | 7.0d | 7c | Union |
| W. P. | Marysville, Cal. | 2.0s | 4c | Union |
| | Chilcoot, Cal.-Reno Jct. | 2.3s | 8c | Union |
| | Alazon, Nev.-Wells | 3.0s | 2c | Union |
| | Hogan, Nev. | 1.1s | 2c | Union |
| | | 2,110.4s | 3,002c | |
| | | 283.7d | 12p | |
| | | 8.0t | 64s | |
| | | 10.9f | | |
| | | | 3,078 | |
| Track Miles | | 2,412.0 | | |
| Road Miles | | 2,743.4 | | |

Legend:

In "Miles of Road" column: s=single track; d=double track; t=three track; f=four track.
In "No. of Signals" column: c=color light; p=position light; s=semaphore.

All-Relay Interlockings Constructed in 1946

| Railroad | Location | No. of Operative Signal Units | No. of switches or derails operated by | | Manufacturer |
|-------------------|---------------------------------|-------------------------------|--|-------------------|--------------|
| | | | Electric Machines | Electro-Pneumatic | |
| A. T. & S. F. | Streator, Ill. | 10 | .. | .. | Union |
| | Edelstein, Ill. | 5 | 5 | .. | Union |
| | Canadian, Tex. | 24 | 12 | .. | Union |
| | Ash Fork, Ariz. | 19 | 9 | .. | Union |
| | Needles, Cal. | 6 | 4 | .. | Union |
| B. & O. | Charlestown, Ohio | 12 | 6 | .. | G.R.S. |
| B. & M. | Petersburg Jct., N. Y. | 8 | .. | .. | G.R.S. |
| C. N. | Chaudiere Valley Crossing, Que. | 10 | .. | .. | G.R.S. |
| | Walsh, Que. | 7 | 1 | .. | G.R.S. |
| | Drummondville, Que. | 12 | 2 | .. | Union |
| | Cantic, Que. | 8 | 2 | .. | G.R.S. |
| | Gohier, Que. | 5 | 1 | .. | Union |
| | Copetown, Ont. | 4 | 1 | .. | Union |
| C. of G. | Macon, Ga. | 3 | 1 | .. | Union |
| C. & O. | Columbus, Ohio | 14 | 9 | .. | Union |
| | Columbus, Ohio | 6 | 3 | .. | Union |
| | Marion, Ohio | 7 | 1 | .. | Union |
| C. B. & Q. | Lincoln (Carling), Neb. | 29 | 15 | .. | G.R.S. |
| | Pacific Jct., Iowa | 13 | 4 | .. | G.R.S. |
| C. G. W. | Bee Creek, Mo. | 4 | .. | .. | Union |
| C. & N. W. | Maple River, Iowa | 9 | 3 | .. | G.R.S. |
| C. M. St. P. & P. | Green Bay Jct., Wis. | 5 | 1 | .. | Union |
| | Birmingham, Mo. | .. | 4 | .. | Union |
| C. R. I. & P. | Columbus Jct., Iowa | 8 | .. | .. | Union |
| | Ft. Worth, Tex. | 19 | 7 | .. | Union |
| D. & H. | Mechanicville, N. Y. | 26 | 19 | .. | G.R.S. |
| D. M. & I. R. | Albion, Minn. | 14 | 3 | .. | Union |
| G. T. W. | Olivers, Ind. | 16 | .. | .. | Union |
| I. U. | Indianapolis, Ind. | 10 | .. | 16 | Union |
| L. V. | New Market, N. J. | 4 | 1 | .. | G.R.S. |
| | Depew, N. Y. | 13 | 12 | .. | G.R.S. |
| M. P. | Poplar Bluff, Mo. | 4 | 1 | .. | G.R.S. |
| | Comiskey, Kan. | 16 | 4 | .. | G.R.S. |
| | Bald Knob N. end, Ark. | 6 | 1 | .. | G.R.S. |
| | Bald Knob S. end, Ark. | 4 | 1 | .. | G.R.S. |
| N. C. & St. L. | Stevenson, Ala. | 8 | 3 | .. | Union |
| | Junta, Ga. | 15 | 8 | .. | Union |
| N. Y. C. | Gardenville Jct., N. Y. | 11 | 3 | .. | G.R.S. |
| | Depew, N. Y. | 49 | 23 | .. | G.R.S. |
| | Edison, Ohio | 5 | 1 | .. | G.R.S. |
| | Paget, Ohio | 8 | 2 | .. | G.R.S. |
| | Paget, Ohio | 5 | 1 | .. | G.R.S. |
| | Delaware, Ohio | 5 | .. | .. | G.R.S. |
| | Jones, Ohio | 7 | 1 | .. | G.R.S. |
| | Worthington, Ohio | 5 | 1 | .. | G.R.S. |
| P. & L. E. | Robinson, Pa. | 10 | 4 | .. | Union |
| N. Y., N. H. & H. | Providence, R. I. | 34 | 30 | .. | Union |
| | Walpole, Mass. | 14 | 4 | .. | Union |
| N. & W. | Delano, Ohio | 7 | .. | 1 | Union |
| N. P. | Laurel, Mont. | 9 | 8 | .. | G.R.S. |

Table continued on next page

before; 1,239 rail feet of retarders, compared with 749 ft.; 43 power switches, compared with 28; 43 track circuits, compared with 28 in 1945; 30 power skates, compared with 29; and 3 tower and control machines, which is the same as for the year before. The total number of car retarders was an increase of 4 over the 1945 figure, while the total number of power machines for switches and skates increased by 16.

During 1946, 2,214 protective units were installed at highway crossing installations, which represents a sizable increase compared with the 1,089 units in 1945. This is an increase of 1,125 units, or 103 per cent. A total of 63 railroads installed protection at 800 crossings; of which 604 were financed by the railroads, 124 by public funds, and 72 by joint railroad and public funds. Of the 2,214 protective units installed, 59 were wig-wag signals, 1,629 flashing-light signals, 101 rotating-disk stop-sign signals, 16 traffic-type stop-and-go signals, and 409 were electrically-operated gates. Of the sizable installations, the Rock Island installed 290 protective units at 32 crossings, the New York Central 199 at 83 crossings, the Pennsylvania 178 at 77 crossings, and the Southern 182 at 68 crossings. In Canada, the C. N. R. and C. P. R. made installations at 11 and 18 crossings, respectively.

Fast Changes in Communications

(Continued from page 91)

Throughout 1946 railroad communication men devoted so much talk to train communication that very little was said about the day-to-day progress in conventional facilities, such as telegraph and telephone service over ordinary line wire circuits. Here too, however, there was considerable progress.

Reviewing briefly, an important event in October, 1945, was an announcement that the Western Union Telegraph Company planned to install high-frequency relay radio systems to transmit commercial messages between principal cities and, therefore would relinquish ownership or joint ownership of pole lines on railroads. This proposal calls for the termination of all contracts on roads east of the Mississippi within five years and the remainder within two more years. Some well-informed men in the Western Union organization now admit that this announcement was a bit premature, but nevertheless the momentous job is underway. The technical details of the development and progress to date in microwave beamed radio relay systems were explained in papers presented at the recent convention of the Communications section, A. A. R. In brief, these papers

| Railroad | Location | No. of Operative Signal Units | No. of switches or derails operated by | | Manu- facturer |
|--------------|----------------------|--|---|-----------------------|-------------------|
| | | | Electric Machines | Electro- Pneumatic | |
| Penna. | Bricker, Ohio | 6 | .. | 6 | Union |
| | Black Run, Ohio | 7 | .. | 3 | Union |
| | Scio, Ohio | 6 | .. | 4 | Union |
| | Londonville, Ohio | 3 | .. | 1 | Union |
| | Harmarville, Pa. | 5 | .. | 3 | Union |
| | Cheswick, Pa. | 5 | .. | 3 | Union |
| | West Robinson, Ohio | 4 | 2 | .. | Union |
| | East Colsan, Ohio | 4 | 2 | .. | Union |
| | Crestline, Ohio | 30 | 23 | .. | Union |
| | West Yard, Ohio | 10 | 16 | .. | Union |
| P. M. | Rendcomb Jct., Ohio | 7 | 7 | .. | Union |
| | Saginaw, Mich. | 14 | 15 | .. | G.R.S. |
| | Tabor Jct., Pa. | 16 | .. | 7 | G.R.S. |
| | Fredericksburg, Va. | 13 | .. | 11 | Union |
| | Alexandria, Va. | 21 | .. | 8 | Union |
| | New Hill, N. C. | 4 | 2 | .. | Union |
| | Merry Oaks, N. C. | 4 | 2 | .. | Union |
| | Lemon Springs, N. C. | 4 | 2 | .. | Union |
| | Orange, Va. | 15 | 11 | .. | G.R.S. |
| | Chattanooga, Tenn. | 35 | 30 | .. | G.R.S. |
| S. P. | El Paso, Tex. | 4 | 2 | .. | Union |
| | Rosenberg, Tex. | 7 | 1 | .. | Union |
| | Bellaire Jct., Tex. | 8 | 2 | .. | Union |
| | Wilbridge, Ore. | 7 | 3 | .. | G.R.S. |
| | Norfolk, Va. | 4 | .. | .. | G.R.S. |
| | Norfolk, Va. | 14 | 8 | .. | G.R.S. |
| | Norfolk, Va. | 4 | .. | .. | G.R.S. |
| | Norfolk, Va. | 4 | .. | .. | G.R.S. |
| | Norfolk, Va. | 4 | 1 | .. | G.R.S. |
| | Norfolk, Va. | 4 | .. | .. | G.R.S. |
| Total Plants | | 821 | 351 | 63 | |

reported that the radio operated as intended on the test project between New York and Philadelphia, and that projects are now under way between New York and Boston, and between New York and Pittsburgh, with tentative plans for extension of the system throughout the United States. The Canadian National and the Canadian Pacific are cooperating in tests of relay radio in Canada.

One railroad, the Chicago, Rock Island & Pacific, made a test installation between Kansas City and Topeka. However, the opinions expressed by railroad men at the recent convention were to the effect that micro-wave beamed radio systems are not adaptable for ordinary use on railroads, such as train dispatching and other communications between offices on a division, and, therefore, that the railroads will continue to use line wires on pole lines for a long, long time.

A micro-wave relay radio system is very expensive to install but is capable of handling a large volume of message traffic. Perhaps several railroads could cooperate in the construction and operation of such a system for long-distance telephone and telegraph message traffic, such as between New York and Chicago. Or perhaps the railroads could lease channels from the Western Union.

Regardless of policies concerning the use of beamed-radio relay systems, the railroads in 1946 went ahead in developing and improving their land lines and conventional telegraph and telephone facilities, construction being limited to a great extent, however, by shortages of material and labor. For the first time since 1940 the railroads were able to rebuild extensive sections of pole line. For example, the Louisville & Nashville rebuilt 292 miles, the Pennsylvania 249 miles, the Great Northern 170, and the

Chesapeake & Ohio 163 miles. The reconstruction of pole lines in the United States and Canada during 1946 totaled 1,839 miles of railroad-owned pole lines, 1,564 miles of lines owned by commercial companies, and 1,283 miles of jointly-owned lines.

During the year just closed the railroads installed telephone train dispatching on 1,590 miles, compared with 2,308 miles in 1945 and 2,318 miles in 1944. Long-distance telephone circuits were added on 25,348 miles in 1946, compared with 21,727 miles in 1945. New printing telegraph represented the largest increase, totaling 53,446 miles of circuits and 467 machines installed in 1946, compared with 20,195 miles and 257 machines in 1945.

During 1946, carrier systems superimposed on existing line wires were installed to derive 26,170 circuit miles for long-distance telephone service, and 47,497 circuit miles for telegraph service, most of which is for printers. Some of these carrier systems add only one voice channel to existing wire circuits, while others add three or more channels. In a speech-plus-duplex there may be a combination of three voice channels and two printing telegraph circuits.

In contrast with yard communication, including radio or inductive telephone equipment on locomotives for conversation between enginemen and the yardmaster, some railroads have installed talk-back loud-speakers at various locations in yards for two-way conversation between yard crews, switchtenders and yardmasters. For example, in a yard at Birmingham, Ala., the Southern installed loud-speakers connected to a control panel in an elevated tower where the yardmaster directs operations, as was explained in an article in the *Railway Age* for Aug. 31, 1946. Similar loud-

speaker systems have been installed in the Southern yard at Atlanta, Ga.; in the Missouri Pacific yards at St. Louis, Mo., and in the Denver & Rio Grande Western yard at Salt Lake City, Utah.

The development of many forms of communication equipment involving electronic apparatus was accelerated tremendously during the war, and these devices and systems are now being adapted for railroad telegraph and telephone services, as was forcefully demonstrated at the exhibits of manufacturers products at the recent convention of the Communications section, A. A. R., explained in some detail in the December issue of *Railway Signaling*.

Equities Depressed

(Continued from page 73)

at 109½. The investment yield to buyers was approximately 2.47 per cent.

In March the U. P. awarded \$81,602,000 of series C, 2½ per cent refunding mortgage bonds due March 1, 1991, to Halsey, Stewart & Co., et al., at 101.27. The price paid for the issue represented a net interest cost to the road of 2.453 per cent. The bonds were reoffered at 102.10 to yield 2.42 per cent to maturity. The proceeds from the sale were to be applied, with other funds, to the retirement at 107 of an equal principal amount of series B, 3 per cent refunding mortgage bonds, also due in 1990, which were marketed September, 1945.

Dividend Changes

The Alabama Great Southern paid \$5.00 per share on its common and on its preferred stock in 1946, compared with a disbursement of \$9.00 on each of these stocks in 1945.

The Atlanta & West Point reduced its dividend from \$5.00 in 1945 to \$4.00 in 1946.

The Atlantic Coast Line paid \$4.00 on its capital stock in 1946 compared with \$3.75 paid in 1945 and \$3.00 in 1944.

The Chicago & North Western omitted a dividend payment in June, 1946, due to the large increase in cost of materials and supplies and the three general wage increases distributed since 1941 with no correspondingly significant freight rate increases in that period. The management promised to take further action on dividends when rate relief is granted by the I. C. C.

The Cincinnati, New Orleans & Texas Pacific reduced its dividend by \$2.00. The road paid \$5.00 in 1946 as compared with \$7.00 in 1945.

The Minneapolis, St. Paul & Saulte Ste. Marie paid an initial dividend of \$2.50 on voting trust certificates representing Series A common stock in 1946.

The Nashville, Chattanooga & St. Louis omitted a dividend declaration in October, 1946, the payment of which would ordinarily have been made in December. Two semi-annual distributions were made in June and December, 1945. A payment of \$1.00 was made in June, 1946.

The New York Central on May 8, 1946, voted to take no action on the dividend due at that time. Dividends of 50 cents a share had been declared at the May meeting of the board in 1943, 1944, and 1945, payable in July.

The New York, Chicago & St. Louis declared dividend totalling \$6.00 on its 6% preference stock in 1946, the first full payment on this issue in any one year for the last 15 years.

The Norfolk & Western paid an extra \$3.00 dividend on its common shares in March, 1946, in addition to \$2.50 quarterly. This was the first extra dividend since 1941 when \$5.00 was paid.

The Pittsburgh & Lake Erie paid \$3.50 in dividends in 1946 compared with \$4.00 in 1945.

The Southern Pacific paid \$4.00 on its capital stock in 1946 compared with \$3.25 in 1945.

The Texas & Pacific paid \$4.00 in dividends in 1946 compared with \$2.50 in 1945.

The Western of Alabama reduced its dividend payment by \$1.00 in 1946, disbursing \$5.00 in that year, compared with \$6.00 in 1945.

Line Abandonments Up Slightly in 1946

The trend of line mileage to decrease sharply each year since 1942 was altered during the past 12 months as miles of line abandoned showed little change from 1945

By **GEORGE E. BOYD**

Associate Editor

THE railways of the United States abandoned 11 miles more of line in 1946 than in 1945. In Canada, 28 miles were abandoned, while in Mexico no lines were discontinued.

In 1946 a total of 423 miles of line was abandoned in the United States, compared with 2,516 miles in 1942, 1,096 miles in 1943, 640 miles in 1944, and 412 miles in 1945. Even this small total mileage abandoned during the year exceeded the total of new lines completed by 355 miles, continuing a trend of a number of years.

Year's Largest Abandonments

There were no large individual abandonments in 1946, such as occurred in some years, particularly in 1942 and 1943, when the demand for second-hand rail was so insistent. The largest single abandonment in 1946 was that part of the Minneapolis, St. Paul & Sault Ste. Marie between McDill, Wis., and Portage, 68.06 miles. The next largest abandonment was that of the Grand Trunk Western between Greenville, Mich., and Muskegon, 49.08 miles. The third in magnitude was that portion of the Missouri Pacific between Sedalia, Mo., and Warsaw, 41.96 miles. In fourth place with respect to the mileage involved was the branch of the Norfolk & Western between Narrows, Va., and Bastian, 30.48 miles. The Chicago, Burlington & Quincy abandoned the largest total mileage of any single railway, 84.94 miles, but this was in two sections, from Humeston, Iowa, to Clearfield, and from Merle Junction, Iowa, to Clarinda.

Three entire railways were abandoned in 1946. The largest of these was the Pioneer & Fayette, between Pioneer, Ohio, and Fayette, 13 miles. The second in order of mileage was the Newaukum Valley between Napavine, Wash., and Onalaska, 10.62 miles. Operations on both of these lines had been suspended for some time, however, before the formal abandonment took place. The third entire railway abandoned was the Bois D'Arc & Southern, at Seagoville, Tex., 7.10 miles.

The foregoing roads compare with 4

The sharp recession in the elimination of railway main and branch lines, which began in 1943 following the peak abandonments in 1942 of 2,516 miles, was stopped in 1946 by the abandonment of 423 miles of line, an increase of 11 miles over the 412 miles taken out of service in the previous year. During the past eight years 76 entire railways have been abandoned, and 31,807 miles of line have disappeared since 1916. This article gives statistics on total abandonments since 1916, and on abandonments by states since 1931.

entire roads abandoned in 1945, with 8 in 1944, with 3 in 1943, with 14 in 1942, and with 14 in 1941. Since 17 roads passed out of existence in 1939 and 13 in 1940, a total of 76 roads have disappeared during the eight-year period ending in 1946. While abandonments are not likely to be on so large a scale in the immediate future as they were during the last decade, that they will continue is evidenced by the fact that several more railways already have petitions before the Interstate Commerce Commission, or are preparing to present them, looking to the abandonment of their entire lines.

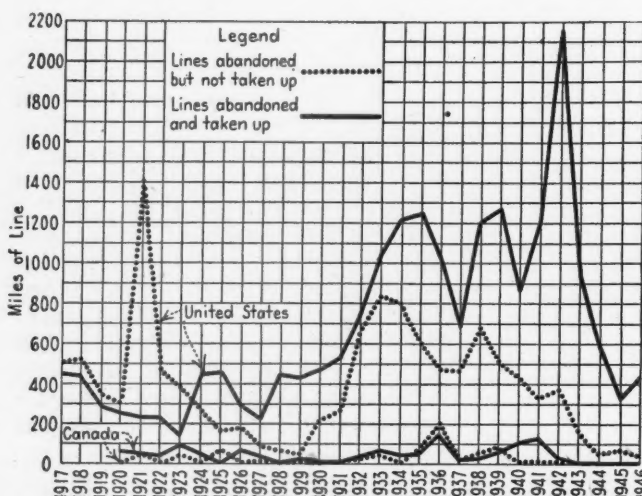
The abandonments that are reported in

any year include all lines abandoned permanently during the year, regardless of whether the tracks have been taken up at the end of the year. If the tracks have not been taken up, the lines are not included in the reports for later years when the tracks are actually removed.

Abandonments were not recorded prior to 1917, primarily because such lines as were abandoned were unimportant, besides which they occurred somewhat sporadically and, generally, in sparsely inhabited country, after exhaustion of the resources which they were constructed to reach. In 1917, however, a total of 942 miles was abandoned permanently, since which time abandonments have ranged annually from 282 miles in 1927 to 2,516 miles in 1942. During the entire 30-year period ending with 1946, a total of 31,807 miles of lines has been abandoned, an average of almost 1,060 miles a year. During the same 30 years period only 10,984 miles of new lines have been constructed, leaving a net decrease of 20,823 in the total railway mileage of the country, an average net reduction of about 694 miles a year.

Rank by States

Of equal, but somewhat wider, interest with the mileage abandoned by individual roads and the total for all roads, is the distribution of these abandonments by



Lines abandoned in the United States and Canada—1917 through 1946, inclusive

Lines Abandoned in the United States, Canada and Mexico in 1946

| | Lines abandoned and taken up (miles) | Lines abandoned but not yet taken up (miles) |
|--------------------------------|--|--|
| United States | | |
| Atchison, Topeka & Santa Fe | | |
| Atwood, Cal., to Olinda.... | 4.26 | |
| Bois D'Arc & Southern | | |
| Entire Line-Seagoville, Tex. | | 7.1 |
| Central of New Jersey | | |
| West End, N. J., to | | |
| East Long Branch..... | 0.88 | |
| North Long Branch, N. J., | | |
| to Highland Beach..... | 4.40 | |
| Chicago & North Western | | |
| At Fond du Lac, Wis. | 0.11 | |
| Beaton, Mich., | | |
| to End of Line..... | 7.01 | |
| Two Rivers Junction, Wis., | | |
| to Rosemere..... | 0.49 | |
| Chicago, Burlington & Quincy | | |
| Humeston, Iowa, to Clear- | | |
| field, and Merle Junction, | | |
| Iowa, to Clarinda..... | 84.94 | |
| Chicago, Rock Island & Pacific | | |
| Paris, Iowa, to Centerville | 21.88 | |
| At Wellington, Kan. | 4.16 | |
| Floris, Iowa, to Paris.... | | 15.00 |
| Clarendon & Pittsford | | |
| Center Rutland, Vt., to end | | |
| of branch..... | 0.19 | |
| Denver & Rio Grande Western | | |
| Castleton, Colo., to Baldwin | 2.09 | |
| La Grande, Utah, | | |
| to Park City..... | 24.10 | |
| Erie | | |
| End of W. B. & E., | | |
| at Plains Junction, Pa. | 0.11 | |
| Grand Trunk Western | | |
| Greenville, Mich., | | |
| to Muskegon..... | 49.08 | |
| Louisville & Nashville | | |
| Warrior, Ala., to Zola..... | 1.65 | |
| Minneapolis, St. Paul & Sault | | |
| Ste. Marie | | |
| McDill, Wis., to Portage.. | 68.06 | |
| Packwaukee Junction, | | |
| Wis., to Montello..... | 7.86 | |
| Missouri Pacific | | |
| Sedalia, Mo., to Warsaw.... | 41.96 | |
| Newaukum Valley | | |
| Napavine, Wash., to Onalaska | 10.62 | |
| New York Central | | |
| Dolgeville, N. Y., to Salis- | | |
| bury Center..... | 2.43 | |
| Norfolk & Western | | |
| End of Narrows branch, | | |
| Narrows, Va., to Bastian | 30.48 | |
| Pennsylvania-Reading | | |
| Longport branch, in Atlantic | | |
| City, N. J..... | 8.39 | |
| Peoria & Pekin Union | | |
| At Pekin, Ill. | 0.11 | |
| Pioneer & Fayette | | |
| Pioneer, Ohio, to Fayette.. | 13.00 | |
| Pittsburgh & Lake Erie | | |
| Broadford Junction, Pa., | | |
| to Broadford..... | 0.29 | |
| Summit, Pa., to Franklin | | |
| coke ovens..... | 0.58 | |
| Fayette City, Pa. to Perry- | | |
| opolis Junction..... | 5.63 | |
| Southern Pacific | | |
| Ogden, Utah line..... | 0.24 | |
| White Hills branch, Cal. | 0.27 | |
| North line, Ariz..... | 1.01 | |
| Jefferson Street branch, Ore. | .18 | |
| Part of Tombstone branch, | | |
| Ariz..... | .42 | 0.48 |
| Niland, Cal., to Calexico.... | | |
| Part of Valley line, Cal. | 0.25 | |
| Part of Siskiyou line..... | 1.36 | |
| Part of Santa Cruz branch, | | |
| Cal..... | 0.38 | |
| Part of Colusa branch..... | 0.76 | |
| Part of Ione branch..... | 0.03 | |
| Part of Covina branch..... | 0.29 | |
| Total..... | 385.44 | 37.09 |

abandoned during the year. For the 15-year period ending with 1946, the four states having the largest total abandonment continued to hold the same relative rank as in 1945. Texas led with 1,423.56 miles; Michigan was second with 1,156.32 miles; California was third with 1,121.78 miles; and Missouri was fourth with 1,104.13 miles.

Regional Abandonments

During this 15-year period, from 1932 to 1946, inclusive, a total of 21,403 miles was abandoned in the United States and Alaska. Of these, 946 miles were in New England; 1,928 miles were in the North Atlantic states; 4,076 miles were in the

Miles of Lines Abandoned in the United States Since 1916

| Year | Miles | Year | Miles |
|------|-------|------|-------|
| 1917 | 942 | 1932 | 1,452 |
| 1918 | 959 | 1933 | 1,876 |
| 1919 | 637 | 1934 | 1,995 |
| 1920 | 536 | 1935 | 1,843 |
| 1921 | 1,626 | 1936 | 1,523 |
| 1922 | 677 | 1937 | 1,140 |
| 1923 | 513 | 1938 | 1,897 |
| 1924 | 693 | 1939 | 1,783 |
| 1925 | 606 | 1940 | 1,299 |
| 1926 | 457 | 1941 | 1,509 |
| 1927 | 282 | 1942 | 2,516 |
| 1928 | 512 | 1943 | 1,096 |
| 1929 | 475 | 1944 | 640 |
| 1930 | 694 | 1945 | 412 |
| 1931 | 795 | 1946 | 423 |

Southeastern states; 5,732 miles were in the Middle Western states; 1,466 miles were in the Northwestern states; 4,948 miles were in the Southwestern states; 2,091 miles were in the Rocky Mountain-Pacific Coast states; and 216 miles were in Alaska.

Since 1932 abandonments in Canada have ranged from 11 to 399 miles annually, except in 1943, when less than

Mileage Abandoned by States in 1946 and Accumulated Total Since 1931

| State | Mileage abandoned in 1946 | Accumulated abandonments since 1931 (miles) |
|----------------|------------------------------------|--|
| Alaska | ..... | 216.47 |
| Alabama | 1.65 | 291.62 |
| Arizona | 1.43 | 205.89 |
| Arkansas | ..... | 463.67 |
| California | 8.08 | 1,121.78 |
| Colorado | 2.09 | 704.16 |
| Connecticut | ..... | 129.75 |
| Delaware | ..... | 37.11 |
| Florida | ..... | 639.60 |
| Georgia | ..... | 516.55 |
| Idaho | ..... | 222.94 |
| Illinois | 0.11 | 676.71 |
| Indiana | ..... | 185.70 |
| Iowa | 121.82 | 1,001.26 |
| Kansas | 4.16 | 854.48 |
| Kentucky | ..... | 394.81 |
| Louisiana | ..... | 423.71 |
| Maine | ..... | 211.79 |
| Maryland | ..... | 96.70 |
| Massachusetts | ..... | 284.99 |
| Michigan | 56.09 | 1,156.32 |
| Minnesota | ..... | 416.13 |
| Mississippi | ..... | 299.59 |
| Missouri | 41.96 | 1,104.13 |
| Montana | ..... | 151.00 |
| Nebraska | ..... | 381.72 |
| Nevada | ..... | 307.29 |
| New Hampshire | ..... | 229.19 |
| New Jersey | 13.67 | 231.21 |
| New Mexico | ..... | 302.13 |
| New York | 2.43 | 611.58 |
| North Carolina | ..... | 357.26 |
| North Dakota | ..... | 23.88 |
| Ohio | 13.00 | 288.23 |
| Oklahoma | ..... | 717.98 |
| Oregon | 0.18 | 280.20 |
| Pennsylvania | 6.61 | 950.53 |
| Rhode Island | ..... | 17.39 |
| South Carolina | ..... | 341.15 |
| South Dakota | ..... | 236.14 |
| Tennessee | ..... | 480.61 |
| Texas | 7.1 | 1,423.56 |
| Utah | 24.34 | 334.67 |
| Vermont | 0.19 | 73.41 |
| Virginia | 30.48 | 437.48 |
| Washington | 10.62 | 353.94 |
| West Virginia | ..... | 316.69 |
| Wisconsin | 76.52 | 772.13 |
| Wyoming | ..... | 128.02 |
| Total..... | 422.53 | 21,403.25 |

one mile was abandoned, and in 1945 when no lines were abandoned. There were 28 miles abandoned in 1946 to make the aggregate for the 15-year period 1,205 miles.

* * *



Great Northern Railway Photo
Plywood-steel caboose on the end of a train of plywood-steel boxcars

states and regions, for the states themselves are vitally concerned with respect to the adequacy of transportation within their borders, as well as the taxable property that is lost to them through abandonments. Iowa had the largest total abandonments in 1946, a total of 121.82 miles having been eliminated; Wisconsin was in second place with 76.52 miles abandoned; Michigan followed in third place with 56.09 miles; and Missouri stood in fourth place with 41.96 miles

97,730 Freight Cars Ordered in 1946

ORDERS for a total of 97,730 freight cars, including 39,999 cars for export, were placed with builders in the United States in 1946, according to reports received by *Railway Age*. Of the 43,325 cars ordered for domestic use by railroads, 9,391 were ordered from company shops and 33,934 from contract builders. Private car lines and industrial companies ordered 3,393 cars from their own shops and 11,013 from contract builders.

Deliveries during the year amounted

By **FRED C. MILES**

Associate Editor

to 59,591 cars, including 17,839 for export. (The delivery figures include an estimate for the last half of December.) Of the 41,752 cars delivered for domestic use, 9,987 were delivered by railroad and private line shops and 31,765 by contract builders.

The cars ordered last year are listed in detail in the appended table. The three accompanying tables summarize and analyze the volume of orders and deliveries from 1920 through 1946.

The detailed list of orders was compiled from reports to *Railway Age* by the railroads, private car lines and industrial concerns. It was checked and amplified with data received from the car builders through the cooperation and assistance of the American Railway Car Institute.

| Number and Classification of Freight Cars Ordered for Domestic Use | | | | | | | | | | | Freight Cars Delivered, 1920-1946 | | | | |
|--|--------|-------|-------|---------|--------|--------|---------|--------|----------|---------|-----------------------------------|----------------|---------|--------------|----------|
| Year | Box | Flat | Stock | Gondola | Hopper | Tank | Refrig. | Others | Non-Rev. | Total | (For Domestic Service) | | | | |
| | | | | | | | | | | | Railroad and Private Line Shops | Contract Shops | Total | U. S. Export | |
| 1946 | 24,950 | 474 | 200 | 2,577 | 14,151 | 4,787 | 9,581 | 452 | 559 | 57,731 | 9,987 | 31,765 | 41,752 | 17,839 | Illinois |
| 1945 | 15,440 | 1,241 | 0 | 6,090 | 12,970 | 915 | 1,085 | 174 | 340 | 38,255 | 12,853 | 31,011 | 43,864 | 10,658 | Illinois |
| 1944 | 31,066 | 823 | 300 | 6,758 | 12,674 | 972 | 1,465 | 371 | 52 | 54,481 | 15,050 | 27,953 | 43,003 | 38,759 | Kansas |
| 1943 | 10,027 | 2,212 | 0 | 5,312 | 18,400 | 556 | 50 | 153 | 320 | 37,030 | 7,220 | 24,616 | 31,836 | 43,117 | Louisian |
| 1942 | 2,351 | 2,330 | 0 | 9,711 | 10,197 | 2,716 | 0 | 1,285 | 0 | 28,560 | 15,444 | 47,429 | 62,873 | 8,529 | Lehigh |
| 1941 | 55,939 | 3,459 | 400 | 15,814 | 23,213 | 2,800 | 2,370 | 1,614 | 1,288 | 106,897 | 17,227 | 63,396 | 80,623 | 2,386 | Louisvil |
| 1940 | 35,530 | 885 | 350 | 9,654 | 14,446 | 1,671 | 785 | 1,991 | 561 | 65,828 | 17,025 | 45,316 | 62,341 | 1,734 | |
| 1939 | 20,140 | 976 | 100 | 6,419 | 21,923 | 2,373 | 675 | 1,127 | 182 | 53,915 | 19,491 | 25,132 | 381 | | |
| 1938 | 7,912 | 931 | 568 | 4,279 | 2,017 | 231 | 0 | 299 | 134 | 16,371 | 9,990 | 16,470 | 611 | | |
| 1937 | 20,564 | 1,365 | 500 | 10,120 | 12,817 | 692 | 1,770 | 287 | 1,827 | 49,942 | 15,569 | 61,929 | 77,498 | 1,321 | Maine |
| 1936 | 21,866 | 1,224 | 453 | 8,782 | 22,271 | 5,745 | 7,495 | 100 | 1,812 | 69,748 | 15,643 | 30,969 | 46,612 | 523 | Minneap |
| 1935 | 8,925 | 75 | 50 | 2,755 | 5,970 | 313 | 600 | 32 | 29 | 18,749 | 1,550 | 16,211 | 25,176 | 1,263 | |
| 1934 | 9,831 | 1,656 | 0 | 2,077 | 10,460 | 346 | 198 | 0 | 3 | 24,571 | 8,965 | 5,965 | 7,515 | 91 | |
| 1933 | 619 | 50 | 0 | 4 | 33 | 269 | 615 | 129 | 1 | 1,720 | 1,300 | 863 | 2,163 | 39 | |
| 1932 | 1,290 | 11 | 0 | 270 | 150 | 52 | 137 | 9 | 32 | 1,951 | 2,770 | 482 | 3,252 | 84 | |
| 1931 | 2,100 | 400 | 750 | 1,072 | 3,113 | 261 | 2,314 | 28 | 159 | 10,197 | 5,706 | 7,497 | 13,203 | 410 | Minneap |
| 1930 | 17,012 | 2,046 | 950 | 9,900 | 4,036 | 2,920 | 5,689 | 384 | 468 | 43,405 | 9,839 | 65,081 | 74,920 | 1,731 | Ste. M |
| 1929 | 57,139 | 3,888 | 2,950 | 18,289 | 16,117 | 4,446 | 3,583 | 789 | 2,940 | 110,141 | 12,878 | 68,712 | 81,590 | 3,448 | |
| 1928 | 21,148 | 3,709 | 906 | 6,495 | 6,087 | 2,585 | 5,568 | 280 | 1,376 | 48,154 | 7,685 | 38,375 | 46,060 | 1,453 | |
| 1927 | 28,975 | 2,694 | 1,668 | 13,735 | 11,835 | 5,930 | 4,432 | 1,067 | 2,655 | 72,991 | 8,540 | 54,830 | 63,370 | 1,453 | |
| 1926 | 18,277 | 1,819 | 2,556 | 8,366 | 11,483 | 4,096 | 10,109 | 2,188 | 2,676 | 61,570 | 9,964 | 78,898 | 88,862 | 2,445 | |
| 1925 | 40,668 | 2,720 | 2,749 | 21,869 | 6,448 | 4,701 | 5,308 | 802 | 1,320 | 86,585 | 11,028 | 94,707 | 105,735 | 3,077 | |
| 1924 | 68,282 | 4,021 | 6,504 | 23,603 | 21,350 | 3,474 | 14,347 | 2,274 | 1,761 | 145,616 | 9,618 | 104,093 | 113,711 | 1,584 | |
| 1923 | 35,386 | 2,904 | 714 | 16,318 | 23,883 | 6,003 | 6,207 | 2,448 | 1,846 | 95,609 | 29,501 | 146,247 | 175,748 | 1,966 | |
| 1922 | 68,767 | 2,800 | 4,236 | 31,742 | 36,223 | 5,795 | 22,587 | 4,385 | 1,675 | 178,210 | 2,423 | 63,866 | 66,289 | 1,399 | |
| 1921 | 5,130 | 292 | 630 | 5,427 | 4,708 | 327 | 4,905 | 1,048 | 298 | 22,765 | 1,033 | 39,259 | 40,292 | 5,351 | |
| 1920 | 14,470 | 1,417 | 3,435 | 10,080 | 23,142 | 15,631 | 8,785 | 1,724 | 1,456 | 80,140 | 14,171 | 46,784 | 60,955 | 14,602 | |

Source: 1946—*Railway Age*; all other—American Railway Car Institute.

Source: American Railway Car Institute. (The 1946 totals include an estimate for the last half December.)

Freight Cars Ordered—1946

Railroad Orders—For Service in the United States

| Purchaser | No. | Class | Capacity | Length ft. in. | Construction | Weight | Date of Order | Date of Delivery | Builder |
|------------------------------|-------|--------------|----------|--------------------|--------------|--------|---------------|-------------------|----------------------|
| Akron, Canton & Youngstown | 25 | Cov. Hopper | 140,000 | 29 3 | Steel | 52,175 | March | 1st qtr. '47 | Amer. Car & Fdy. |
| Ann Arbor | 50 | S. S. Box | 80,000 | 40 6 | Steel | 46,200 | February | 1st qtr. '47 | Company Shops |
| Atchison, Topeka & Santa Fe | 750 | Box | 100,000 | 40 6 | Steel | 43,100 | March | 4th qtr. '46 | Pullman-Standard |
| | 350 | Refrigerator | 80,000 | 39 0 | Steel | 58,100 | April | Dec. '46-Jan. '47 | Pullman-Standard |
| | 750 | Box | 100,000 | 40 6 | Steel | 43,000 | September | 2nd qtr. '47 | General American |
| Atlanta & West Point | 50 | Box | 100,000 | 40 6 | Steel | 45,600 | September | July '47 | Pullman-Standard |
| Baltimore & Ohio | 500 | D. S. Box | 100,000 | 50 6 | Steel | 68,000 | January | December | Harlan & Holl'sworth |
| | 600* | D. S. Box | 100,000 | 40 6 | Steel | 49,800 | December | November | Bethlehem Steel |
| | 300* | D. S. Box | 100,000 | 40 6 | Steel | 49,800 | December | December | Pressed Steel |
| | 1,000 | Hopper | 100,000 | 33 0 | Steel | 40,500 | July | Feb. '47 | Pullman-Standard |
| | 1,000 | Hopper | 100,000 | 33 0 | Steel | 40,500 | July | 1st qtr. '47 | Bethlehem Steel |
| | 1,000 | D. S. Box | 100,000 | 40 6 | Steel | 45,200 | August | 2nd qtr. '47 | Pressed Steel |
| | 1,000 | Hopper | 100,000 | 33 0 | Steel | 40,500 | September | 3rd qtr. '47 | Bethlehem Steel |
| | 500 | Hopper | 140,000 | 40 8 | Steel | 50,100 | September | 2nd qtr. '47 | Pressed Steel |
| | 500 | Hopper | 140,000 | 40 8 | Steel | 50,100 | September | April '47 | Pullman-Standard |
| Bangor & Aroostook | 100 | Pulpwood | 100,00 | 46 0 | Steel | 56,000 | March | December | Magor |
| Boston & Maine | 20 | Cov. Hopper | 140,000 | 29 3 | Steel | 51,000 | January | October | Amer. Car & Fdy. |
| | 500 | S. S. Box | 100,000 | 40 6 | Steel | 46,100 | November | 2nd qtr. '47 | Pullman-Standard |
| Cambria & Indiana | 2 | Air Dump | 100,000 | 31 6 | Steel | 69,000 | January | March '47 | Pressed Steel |
| Central of Georgia | 200 | Pulpwood | 100,000 | 40 6 | Steel | ..... | July | ..... | Pullman-Standard |
| Central of Pennsylvania | 125 | Cov. Hopper | 140,000 | 29 6 | Steel | 52,000 | May | 1st qtr. '47 | Harlan & Holl'sworth |
| | 8 | Cov. Hopper | 140,000 | 25 6 | Steel | 44,000 | September | 1st qtr. '47 | Harlan & Holl'sworth |
| | 1,250 | Box | 100,000 | 40 6 ¹¹ | Steel | 46,000 | November | May '47 | Amer. Car & Fdy. |
| Chesapeake & Ohio | 50 | Caboose | 60,000 | 24 1/2 | Steel | 41,400 | March | Feb. '47 | Amer. Car & Fdy. |
| | 10 | Alum. Box | 100,000 | 40 6 | Alum.-S.U. | 39,000 | March | May '47 | Company Shops |
| Chicago & Eastern Illinois | 6 | Caboose | 60,000 | 24 1/2 | Steel | 41,400 | April | ..... | Amer. Car & Fdy. |
| Chicago & North Western | 140 | Cov. Hopper | 140,000 | 29 3 | Steel | ..... | July | Jan. '47 | Bethlehem Steel |
| Chicago, Burlington & Quincy | 800 | S. S. Box | 100,000 | 40 6 | Steel | 46,000 | September | July '47 | Company Shops |
| | 100 | S. S. Parts | 100,000 | 50 6 | Steel | 58,000 | September | Oct. '47 | Company Shops |
| | 200 | Stock | 80,000 | 40 6 | Steel Frame | 40,000 | September | Nov. '47 | Company Shops |
| | 100 | Flat | 100,000 | 53 6 | Steel | 49,000 | September | Nov. '47 | Company Shops |
| | 1,000 | Hopper | 110,000 | 34 3 | Steel | 38,900 | September | Sept. '47 | Company Shops |
| Chicago Great Western | 25 | Cov. Hopper | 140,000 | 29 3 | Steel | 53,100 | March | Jan. '47 | Pullman-Standard |
| | 500 | S. S. Box | 100,000 | 40 6 | Steel | 44,000 | November | May '47 | Pullman-Standard |

6

re listed
e. The
mmarize
lers and
1946.
as com-
Age by
and in-
ked and
from the
tion and
way Car

0-1946

U. S.
Export
17,839
10,658
38,759
43,117
8,529
2,386
1,734
381
611
1,321
523
1,263
91
39
84
410
1,731
3,448
1,453
1,453
2,445
3,077
1,584
1,966
1,399
5,351
14,602

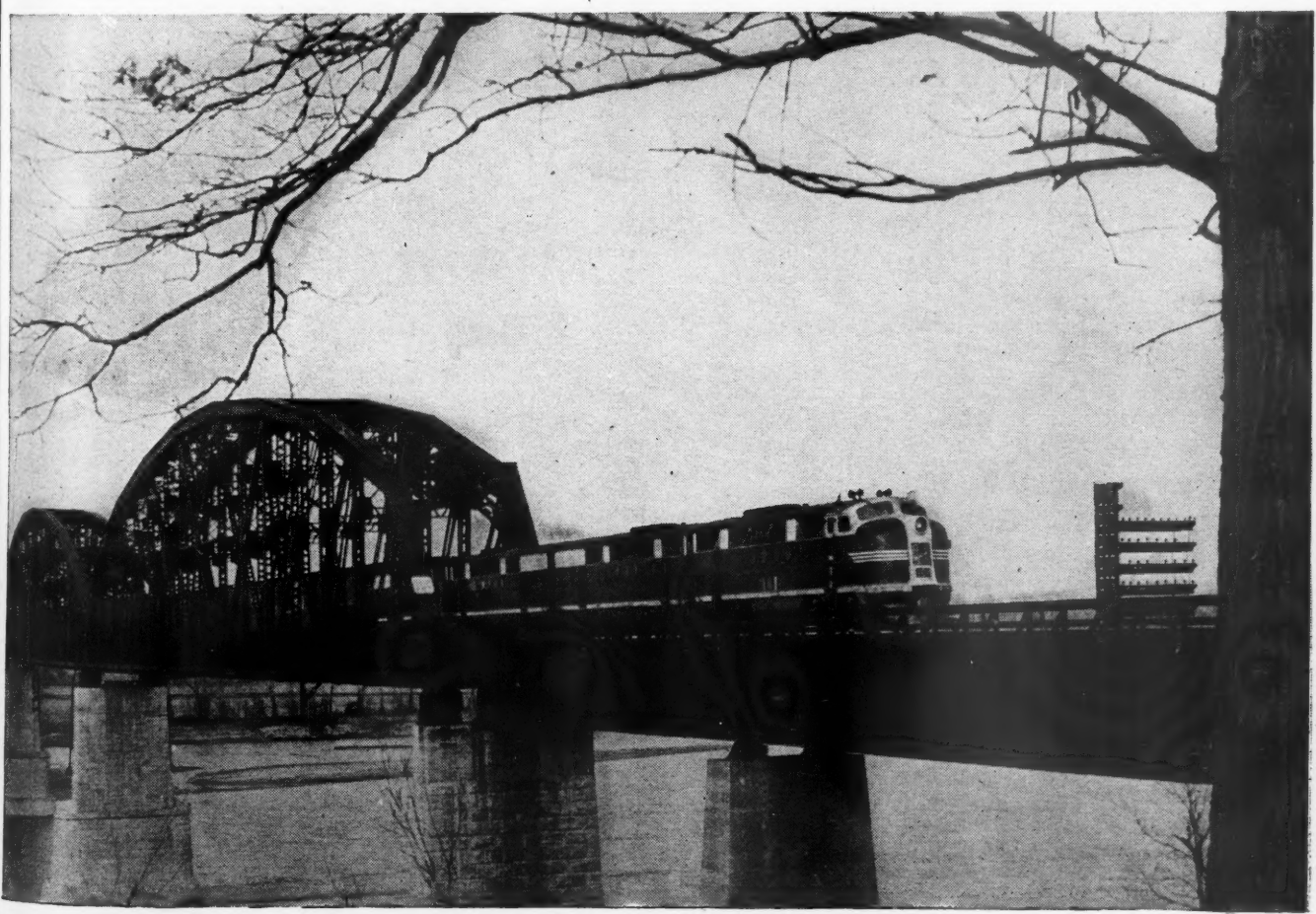
e. (The
last half

Fdy.
os
ard
ard
ican
ard
l'sworth
el
ard
el
el
ard
Fdy.
ard
ard
l'sworth
l'sworth
Fdy.
Fdy.
s
Fdy.
el
s
s
ard
rd

, 1947

| Purchaser | No. | Class | Capacity | Length ft. in. | Construction | Weight | Date of Order | Date of Delivery | Builder |
|--|-------|-------------|----------|-------------------|----------------|--------|------------------|---------------------|----------------------|
| Chicago, Indianapolis & Louisville | 100 | Cov. Hopper | 140,000 | 29 3 | Steel | 50,800 | August | 1st qtr. '47 | Amer. Car & Fdy. |
| Chicago, Milwaukee, St. Paul & Pacific | 500 | Box | 100,000 | 40 6 | Steel | 45,000 | July | 1st half '47 | Pullman-Standard |
| | 750 | Box | 100,000 | 40 6 | Steel Frame | ..... | Mar. & Apr. | Nov. '46-Feb. '47 | Company Shops |
| | 250 | Auto | 100,000 | 50 6 | Steel Frame | ..... | Apr. & May | Jan. & Feb. '47 | Company Shops |
| | 250 | Auto | 100,000 | 50 6 | Steel Frame | ..... | May & Sept. | Feb. & Mar. '47 | Company Shops |
| | 500 | Auto | 80,000 | 40 6 | Steel Frame | ..... | May & Sept. | Mar. & Apr. '47 | Company Shops |
| Clinchfield | 8 | Caboose | ..... | 27 2 | Steel | 43,800 | September | 1st qtr. '47 | Harlan & Holl'sworth |
| Columbus & Greenville | 50 | Gondola | 100,000 | 41 9 | Steel | 44,000 | January | December | Amer. Car & Fdy. |
| Delaware, Lackawanna & Western | 500 | D. S. Box | 100,000 | 46 6 1/2 | Steel | 46,250 | June | 2nd qtr. '47 | Magor |
| | 500 | Hopper | 100,000 | 34 4 | Low Alloy-H.S. | 39,000 | June | 1st qtr. '47 | Amer. Car & Fdy. |
| | 500 | Hopper | 100,000 | 34 4 | Steel | 38,800 | June | 4th qtr. | Bethlehem Steel |
| Delaware & Hudson | 200* | Hopper | 100,000 | 29 0 | Steel | 34,800 | Dec. '45 | December | Company Shops |
| | 25* | S. S. Box | 100,000 | 40 6 | Steel | 46,200 | Dec. '45 | September | Amer. Car & Fdy. |
| | 50 | Cov. Hopper | 100,000 | 29 3 | Steel | 51,200 | May | Mar. '47 | Greenville |
| | 325 | Gondola | 100,000 | 41 10 | Steel | 43,000 | July | May '47 | Bethlehem Steel |
| | 75 | Gondola | 100,000 | 41 10 | Steel | 44,000 | July | June '47 | Bethlehem Steel |
| | 100 | S. S. Box | 80,000 | 40 6 | Steel | 39,000 | October | ..... | Company Shops |
| | 200 | Hopper | 100,000 | 29 0 | Steel | 34,800 | December | ..... | Company Shops |
| Detroit & Mackinac | 200 | S. S. Box | 100,000 | 40 6 | Steel Frame | 45,200 | January | Jan. '47 | General American |
| | 25 | Gondola | 100,000 | 41 6 | Steel | 45,000 | April | Jan. '47 | General American |
| Detroit & Toledo Shore Line | 50 | Cov. Hopper | 140,000 | 29 3 | Steel | 51,200 | August | Mar. '47 | Greenville |
| | 25 | Cov. Hopper | 140,000 | ..... | ..... | ..... | January | Jan. '47 | Harlan & Holl'sworth |
| Erie | 500 | S. S. Box | 100,000 | 40 6 1/2 | Steel | 46,000 | July | Mar. '47 | Amer. Car & Fdy. |
| | 200 | Gondola | 140,000 | 52 6 | Steel | 63,200 | July | Mar. '47 | Bethlehem Steel |
| | 300 | Hopper | 100,000 | 33 0 | Steel | 41,800 | July | Mar. '47 | Greenville |
| Georgia | 50 | Box | 100,000 | 40 6 | Steel | 45,600 | September | July '47 | Pullman-Standard |
| Great Northern | 25 | Cov. Hopper | 140,000 | 29 3 | Steel | 50,760 | January | October | Amer. Car & Fdy. |
| | 400 | Box | 100,000 | 40 6 | Steel | 43,200 | May | April '47 | Company Shops |
| | 100 | Auto | 100,000 | 40 6 | Steel | 48,000 | May | April '47 | Company Shops |
| Gulf Coast Lines | 50 | Cov. Hopper | 140,000 | 29 3 | Steel | 52,600 | January | Jan. '47 | Amer. Car & Fdy. |
| Gulf, Mobile & Ohio | 50* | D. S. Auto | 100,000 | 50 6 | Steel | 60,300 | Dec. '45 | September | Amer. Car & Fdy. |
| | 50* | D. S. Auto | 100,000 | 40 6 | Steel | 53,000 | Dec. '45 | Dec. '46-Jan. '47 | Amer. Car & Fdy. |
| | 50 | Cov. Hopper | 140,000 | 29 3 | Steel | 53,100 | February | Jan. '47 | Pullman-Standard |
| | 1,000 | D. S. Box | 100,000 | 40 6 | Steel | 46,000 | April | Dec. '46-Feb. '47 | Amer. Car & Fdy. |
| | 420 | D. S. Box | 100,000 | 40 6 | Steel | 46,000 | August | 1st qtr. '47 | Amer. Car & Fdy. |
| | 80 | D. S. Auto | 100,000 | 40 6 | Steel | 53,000 | August | 1st qtr. '47 | Amer. Car & Fdy. |
| Illinois Central | 100 | Cov. Hopper | 140,000 | 29 3 | Steel | 53,300 | February | Jan. '47 | Pullman-Standard |
| | 400 | Hopper | 100,000 | 34 2 | Steel | 34,500 | August | June '47 | General American |
| Illinois Terminal | 350 | D. S. Box | 100,000 | 40 6 | Steel | 46,000 | May | 1st qtr. '47 | Amer. Car & Fdy. |
| Kansas City Southern | 25* | Cov. Hopper | 140,000 | 40 2 | Steel | 63,100 | Nov. '45 | 1st qtr. '47 | Darby |
| Louisiana & Arkansas | 100 | Pulpwood | 140,000 | 50 0 | Steel | 54,200 | September | 3rd qtr. '47 | Amer. Car & Fdy. |
| Lehigh & Hudson River | 20 | Cov. Hopper | 140,000 | 25 6 | Steel | 46,000 | September | 1st qtr. '47 | Harlan & Holl'sworth |
| Lehigh Valley | 500 | Box | 100,000 | 40 6 | Steel | 44,500 | October | 2nd qtr. '47 | Pullman-Standard |
| | 100 | Gondola | 140,000 | 65 6 | Steel | 60,000 | October | July '47 | Bethlehem Steel |
| Louisville & Nashville | 1,250 | Hopper | 100,000 | 33 0 | Steel | 40,600 | July | 1st qtr. '47 | Pullman-Standard |
| | 750 | Hopper | 100,000 | 33 0 | Steel | 41,340 | July | 1st qtr. '47 | Amer. Car & Fdy. |
| | 1,000 | Box | 100,000 | 40 6 | S.S. | 46,000 | July | 1st qtr. '47 | Pressed Steel |
| | 300 | Flat | 100,000 | 53 6 | S.U. | 51,300 | October | April '47 | Greenville |
| Maine Central | 15 | Cov. Hopper | 140,000 | 29 3 | Steel | 51,000 | August | 1st qtr. '47 | Amer. Car & Fdy. |
| | 250 | S. S. Box | 100,000 | 40 6 | Steel | 46,100 | November | 2nd qtr. '47 | Pullman-Standard |
| Minneapolis & St. Louis | 50 | Cov. Hopper | 140,000 | 29 3 | Steel | ..... | January | Jan. '47 | Pullman-Standard |
| | 250 | Gondola | 100,000 | 41 0 | Steel | 50,800 | February | Jan. '47 | General American |
| | 600 | Box | 100,000 | 40 6 | Steel | 45,000 | December | 3rd qtr. '47 | General American |
| Minneapolis, St. Paul & Sault Ste. Marie | 20 | Cov. Hopper | 140,000 | 29 3 | Steel | 52,600 | March | December | Amer. Car & Fdy. |

* * *



| Purchaser | No. | Class | Capacity | Length ft. in. | Construction | Weight | Date of Order | Date of Delivery | Builder |
|---|-------|--------------|----------|----------------------------------|--------------|---------|------------------|-------------------------------|----------------------|
| Missouri-Kansas-Texas | 100 | Cov. Hopper | 140,000 | 29 3 | Steel | 53,000 | June | April '47 | Amer. Car & Fdy. |
| Missouri Pacific | 50 | Cov. Hopper | 140,000 | 29 3 | Steel | 51,000 | January | Jan. '47 | Amer. Car & Fdy. |
| Nashville, Chattanooga & St. Louis | 500 | Box | 100,000 | 40 6 | Steel | ..... | August | ..... | Pullman-Standard |
| | 200 | Gondola | 100,000 | 40 6 | Steel | ..... | August | ..... | Pullman-Standard |
| | 300 | Hopper | 100,000 | 33 0 | Steel | ..... | August | ..... | Pullman-Standard |
| New York Central | 1,000 | Box | 110,000 | 40 6 | Steel | 46,600 | September | June '47 | Despatch Shops |
| | 1,000 | Auto | 110,000 | 40 6 | Steel | 52,000 | September | May '47 | Despatch Shops |
| New York, Chicago & St. Louis.. | 10 | Box | 100,000 | 40 6 | Alum.-S.U. | 39,000 | March | May '47 | Company Shops |
| New York, New Haven & Hartford | 75 | Caboose | ..... | 27 1 ¹ / ₂ | Steel | 43,800 | February | Early '47 | Harlan & Holl'sworth |
| | 10 | Air Dump | 100,000 | 29 6 | Steel | 60,870 | November | May '47 | Magor |
| Norfolk & Western | 250 | D. S. Box | 100,000 | 40 6 | Steel | 46,200 | March | Dec.'46-Jan.'47 | Company Shops |
| | 1 | Flat | 250,000 | 53 2 | Steel | 108,500 | July | 1947 | Company Shops |
| Norfolk Southern | 250 | D. S. Box | 100,000 | 40 6 | Steel | 46,000 | September | May '47 | Pullman-Standard |
| Northern Pacific | 250 | Refrigerator | 80,000 | 33 2 ³ / ₄ | Steel | 53,200 | July | 1947 | Pacific Car & Fdy. |
| Pennsylvania | 500 | D. S. Box | 100,000 | 50 6 | Steel | 45,900 | September | April '47 | Company Shops |
| | 500 | D. S. Box | 100,000 | 50 6 | Steel | 46,000 | September | June '47 | Company Shops |
| | 100 | D. S. Box | 100,000 | 60 6 | Steel | 49,700 | September | July '47 | Company Shops |
| Pere Marquette | 25 | Caboose | 60,000 | 24 1 ⁵ / ₈ | Steel | 45,000 | September | March '47 | Harlan & Holl'sworth |
| Pittsburgh & West Virginia | 100* | Box | 100,000 | 40 6 | Steel | ..... | Dec. '45 | Jan. '47 | Amer. Car & Fdy. |
| | 100 | Hopper | 120,000 | 33 0 | Steel | 41,340 | March | December | Amer. Car & Fdy. |
| Reading | 800 | D. S. Box | 100,000 | 40 0 | Steel | 46,600 | November | June '47 | Company Shops |
| | 200 | D. S. Box | 100,000 | 50 6 | Steel | 54,500 | November | Oct. '47 | Company Shops |
| | 25 | Caboose | ..... | 24 4 ³ / ₈ | Steel | 41,000 | November | Nov. '47 | Company Shops |
| Seaboard Air Line | 200 | Phosphate | 140,000 | 34 9 ³ / ₄ | Steel | 50,700 | February | 1947 | Pullman-Standard |
| | 150 | Cov. Hopper | 140,000 | 29 3 | Steel | 52,900 | July | Feb. '47 | Bethlehem Steel |
| | 50 | Auto | 100,000 | 50 6 | Steel | 62,700 | July | 1947 | Pullman-Standard |
| Southern | 1,000 | S. S. Box | 100,000 | 40 6 | Steel | 47,400 | April | 500-Oct.'46 500-Mar.'47 | Pullman-Standard |
| | 600 | Gondola | 100,000 | 41 6 | Steel | ..... | April | Feb. '47 | Pressed Steel |
| | 250 | Ballast | 140,000 | 40 8 | Steel | 56,000 | April | April '47 | Amer. Car & Fdy. |
| | 150 | Hopper | 140,000 | 29 3 | Steel | ..... | April | 1st qtr. '47 | Harlan & Holl'sworth |
| Southern Pacific | 500 | S. S. Box | 100,000 | 40 6 | Steel | 40,500 | October | Mid-'47 | Pullman-Standard |
| Texas & New Orleans | 500 | S. S. Box | 100,000 | 40 6 | Steel | 40,500 | October | 2nd qtr. '47 | Pullman-Standard |
| Union Pacific | 1,500 | Box | 100,000 | 40 6 | Steel | ..... | July | 1st qtr. '47 | Pullman-Standard |
| | 500 | Box | 100,000 | 40 6 | Steel | 42,000 | July | 2nd qtr. '47 | General American |
| | 500 | Auto | 100,000 | 40 6 | Steel | 46,000 | July | 2nd qtr. '47 | Amer. Car & Fdy. |
| | 1,000 | Hopper | 140,000 | 40 8 | Steel | 56,000 | October | 2nd qtr. '47 | Amer. Car & Fdy. |
| Union Railroad | 400 | Hopper | 140,000 | 33 0 | Steel | 47,700 | January | Sept.-Oct. | Greenville |
| | 100 | Hopper | 140,000 | 33 0 | Steel | 44,400 | January | October | Greenville |
| Western Maryland | 200 | D. S. Box | 100,000 | 40 6 | Steel | ..... | August | April '47 | Bethlehem Steel |
| | 500 | Hopper | 110,000 | 31 0 | Steel | ..... | August | 2nd qtr. '47 | Bethlehem Steel |
| | 100 | Hopper | 110,000 | 31 0 | Steel | ..... | August | June '47 | Bethlehem Steel |
| Wabash | 500* | Gondola | 100,000 | 41 6 | Steel | 43,900 | Sept. '45 | November | Company Shops |
| | 200 | S. S. Box | 80,000 | 40 6 | Steel | 46,200 | February | 1st qtr. '47 | Company Shops |
| | 60 | Cov. Hopper | 140,000 | 29 3 | Steel | 51,000 | March | 1st qtr. '47 | Amer. Car & Fdy. |
| | 20 | Caboose | ..... | 28 5 ¹ / ₂ | Steel | ..... | June | Jan. '47 | Company Shops |
| Western of Alabama | 50 | Box | 100,000 | 40 6 | Steel | 45,600 | September | July '47 | Pullman-Standard |
| Western Pacific | 250 | D. S. Box | 100,000 | 40 6 | Steel | 47,000 | July | Sept. '47 | Mt. Vernon |
| Wheeling & Lake Erie | 750 | Gondola | 100,000 | 41 6 | Steel | 40,400 | February | 4th qtr. '46- 1st qtr. '47 | Ralston |
| | 750 | Hopper | 120,000 | 33 1 ¹ / ₂ | Steel | 41,340 | February | 1947 | Amer. Car & Fdy. |

* Not listed last year.

Private Car Line and Other Orders—For Service in the United States

| Purchaser | No. | Class | Capacity | Length ft. in. | Construction | Weight | Date of Order | Date of Delivery | Builder |
|---|-------|--------------|----------|-----------------------------------|--------------|--------|------------------|---------------------|----------------------|
| Adirondack Gas Corp. | 3 | Tank | 100,000 | 35 2 ⁷ / ₈ | Steel | 69,160 | November | ..... | Amer. Car & Fdy. |
| Allied Chemical & Dye Corp. (Barrett division) | 100 | Tank | 100,000 | 34 1 ¹ / ₄ | Steel | 56,500 | January | ..... | Amer. Car & Fdy. |
| | 100 | Tank | 10,000g. | ..... | ..... | ..... | January | 1946-47 | General American |
| American Locomotive Co. | 1 | Flat | 100,000 | 53 6 | Steel | 45,000 | May | August | Amer. Car & Fdy. |
| American Refrigerator Transi.. | 900 | Refrigerator | 80,000 | 33 2 ³ / ₄ | Steel | 52,100 | November | ..... | Pullman-Standard |
| | 900 | Refrigerator | 80,000 | 33 2 ³ / ₄ | Steel | 52,100 | November | 3rd qtr. '47 | General American |
| | 200 | Refrigerator | 80,000 | 33 2 ³ / ₄ | Steel | 52,100 | November | ..... | Company Shops |
| American Rolling Mill Co. | 9 | Flat | 250,000 | ..... | ..... | ..... | January | Jan. '47 | Pressed Steel |
| Ansul Chemical Co. | 1 | Tank | 60,000 | ..... | ..... | ..... | April | December | General American |
| | 1 | Tank | 40,000 | ..... | ..... | ..... | May | Jan. '47 | General American |
| | 1 | Tank | 40,000 | ..... | ..... | ..... | September | June '47 | General American |
| | 1 | Tank | 60,000 | ..... | ..... | ..... | September | June '47 | General American |
| Atlas Powder Co. | 2 | Tank | 8,000g. | ..... | ..... | ..... | May | Jan. '47 | General American |
| | 1 | Tank | 8,000g. | ..... | ..... | ..... | September | July '47 | General American |
| | 1 | Tank | 10,000g. | ..... | ..... | ..... | September | June '47 | General American |
| Baker Castor Oil Co. | 3 | Air Dump | ..... | ..... | ..... | ..... | August | April '47 | Pressed Steel |
| Bethlehem Pacific Coast Steel Corp. | 60 | Flat | 140,000 | 36 0 | Steel | 40,100 | February | Sept.-Oct. | Bethlehem Steel |
| Birmingham Slag Co. | 10 | Ore | 140,000 | 20 11 | Steel | ..... | January | December | Pullman-Standard |
| Buffalo Electro Chemical Co. .. | 2 | Tank | 80,000 | 24 8 ³ / ₈ | Steel | 32,500 | February | ..... | Amer. Car & Fdy. |
| | 2 | Tank | 4,000g. | ..... | ..... | ..... | February | September | General American |
| Burnwell Gas Corp. | 2 | Tank | 80,000 | 35 2 ⁷ / ₈ | Steel | 67,860 | November | ..... | Amer. Car & Fdy. |
| Cabot Carbon Co. | 20 | Hopper | 100,000 | 45 10 ¹ / ₂ | Steel | 50,800 | January | ..... | Amer. Car & Fdy. |
| California Dispatch Line | 15 | Tank | 100,000 | 44 1 ¹ / ₂ | Steel | 79,000 | February | Feb. '47 | Amer. Car & Fdy. |
| | 20 | Tank | 80,000 | 33 8 ³ / ₈ | Steel | 45,500 | March | Mar. '47 | Amer. Car & Fdy. |
| Cities Service Oil Co. (Dela.).. | 15 | Tank | 100,000 | ..... | Steel | 45,000 | October | July '47 | General American |
| Columbian Carbon Co. | 20 | Cov. Hopper | 80,000 | 45 10 ¹ / ₂ | Steel | 49,300 | March | ..... | Amer. Car & Fdy. |
| Commodities Car Co. | 5 | Tank | 80,000 | 29 6 | Steel | 40,100 | March | ..... | Amer. Car & Fdy. |
| Cnnsolidated Chemical Industries Inc. | 6 | Tank | ..... | ..... | Steel | ..... | January | ..... | Amer. Car & Fdy. |
| | 3 | Tank | 100,000 | 29 7 ¹ / ₈ | Steel | 42,700 | May | ..... | Amer. Car & Fdy. |
| | 10 | Tank | 200,000 | 40 11 ¹ / ₈ | Steel | 64,190 | September | ..... | Amer. Car & Fdy. |
| | 5 | Tank | 10,000g. | ..... | ..... | ..... | May | Feb. '47 | General American |
| Detroit Chemical Works | 2 | Tank | 7,000g. | ..... | Steel | ..... | May | Feb. '47 | General American |
| | 1 | Tank | 8,000g. | ..... | Steel | ..... | September | July '47 | General American |
| Dewey Portland Cement Co. | 20 | Cov. Hopper | 140,000 | 29 3 | Steel | 53,000 | June | ..... | Amer. Car & Fdy. |
| Diamond Alkali Co. | 4 | Cov. Hopper | 140,000 | ..... | Steel | ..... | April | Oct.-Nov. | Harlan & Holl'sworth |
| | 7 | Tank | ..... | ..... | ..... | ..... | May | December | General American |
| | 5 | Tank | 60,000 | ..... | ..... | ..... | August | May '47 | General American |
| | 5 | Tank | 110,000 | ..... | ..... | ..... | August | May '47 | General American |
| Donner Hanna Coke Corp. | 85 | Hopper | 140,000 | 40 8 | Steel | 49,400 | July | Mar. '47 | Amer. Car & Fdy. |
| Dow Chemical Co. | 10 | Tank | 100,000 | 34 1 | Steel | 64,000 | February | ..... | Amer. Car & Fdy. |
| (Texas Division) | 20 | Tank | 10,000g. | ..... | ..... | ..... | March | Feb. '47 | General American |
| | 40 | Tank | 10,000g. | ..... | ..... | ..... | July | April-May '47 | General American |
| (Great Western Division) | 10 | Tank | 8,000g. | ..... | ..... | ..... | September | July '47 | General American |
| Electro Metallurgical Co. | 7 | Cov. Hopper | 140,000 | 29 3 | Steel | 52,000 | January | ..... | Amer. Car & Fdy. |
| Foley Butane Co. | 2 | Tank | 100,000 | 35 2 ⁷ / ₈ | Steel | 69,160 | November | ..... | Amer. Car & Fdy. |
| Fruit Growers' Express | 1,000 | Refrigerator | 80,000 | 40 0 | ..... | 53,300 | April | 1947 | Company Shops |
| | 100 | Refrigerator | 100,000 | 40 0 | ..... | 60,000 | April | 1947 | Company Shops |
| | 96 | Refrigerator | 80,000 | 40 0 | ..... | 55,000 | August | 1946-47 | Company Shops |

| | Purchaser | No. | Class | Capacity | Length ft. in. | Construction | Weight | Date of Order | Date of Delivery | Builder |
|--|---|-------|--------------|----------|-------------------|--------------|--------|------------------|---------------------|----------------------|
| | Fuelane Corp. | 6 | Tank | 80,000 | 38 10 1/4 | Steel | 67,060 | May | ..... | Amer. Car & Fdy. |
| | Gas & Oil Products, Inc. | 10 | Tank | 80,000 | 38 10 1/4 | Steel | 67,060 | August | ..... | Amer. Car & Fdy. |
| | Gas, Inc. | 10 | Tank | 100,000 | 35 2 1/2 | Steel | 69,160 | September | ..... | Amer. Car & Fdy. |
| | General American Transportation Corp. | 20 | Tank | 60,000 | ..... | ..... | ..... | October | ..... | Amer. Car & Fdy. |
| | | 20 | Tank | 100,000 | ..... | ..... | ..... | January | 1946 | General American |
| | | 10 | Tank | 80,000 | ..... | ..... | ..... | January | 1947 | General American |
| | | 2 | Tank | 100,000 | ..... | ..... | ..... | January | Feb. '47 | General American |
| | | 1 | Tank | 80,000 | ..... | ..... | ..... | March | Jan. '47 | General American |
| | | 10 | Tank | 140,000 | ..... | ..... | ..... | March | Jan. '47 | General American |
| | | 2 | Tank | 100,000 | ..... | ..... | ..... | March | Feb. '47 | General American |
| | | 20 | Tank | 80,000 | ..... | ..... | ..... | April | 1946 | General American |
| | | 295 | Tank | 100,000 | ..... | ..... | ..... | April | 1947 | General American |
| | | 1 | Tank | 80,000 | ..... | ..... | ..... | May | 1947 | General American |
| | | 19 | Cov. Hopper | 100,000 | ..... | ..... | ..... | May | 1947 | General American |
| | | 5 | Tank | 140,000 | ..... | ..... | ..... | June | 1947 | General American |
| | | 5 | Tank | 80,000 | ..... | ..... | ..... | July | 1947 | General American |
| | | 175 | Tank | 100,000 | ..... | ..... | ..... | July | 1947 | General American |
| | | 263 | Tank | 100,000 | ..... | ..... | ..... | July | 1947 | General American |
| | | 75 | Tank | 140,000 | ..... | ..... | ..... | July | 1947 | General American |
| | | 30 | Tank | 80,000 | ..... | ..... | ..... | July | 1947 | General American |
| | | 75 | Tank | 100,000 | ..... | ..... | ..... | September | 1947 | General American |
| | | 4 | Tank | 80,000 | ..... | ..... | ..... | September | 1947 | General American |
| | | 35 | Tank | 100,000 | ..... | ..... | ..... | September | 1947 | General American |
| | | 41 | Tank | 140,000 | ..... | ..... | ..... | October | 1947 | General American |
| | | 10 | Tank | 100,000 | ..... | ..... | ..... | October | 1947 | General American |
| | | 2 | Tank | 80,000 | ..... | ..... | ..... | November | 1947 | General American |
| | | 21 | Cov. Hopper | 100,000 | ..... | ..... | ..... | November | 1947 | General American |
| | | 11 | Tank | 100,000 | ..... | ..... | ..... | November | 1947 | General American |
| | General Electric Co. | 3 | Cov. Hopper | 140,000 | 29 3 | Steel | 52,600 | March | ..... | Amer. Car & Fdy. |
| | Glen Alden Coal Co. | 2 | Air Dump | 100,000 | 40 6 | Steel | ..... | August | April '47 | Pressed Steel |
| | Gulf Oil Corp. | 30 | S. S. Box | 100,000 | 29 3 | Steel | 52,000 | November | 1st qtr. '47 | Pullman-Standard |
| | Halliburton Oil Well Co. | 50 | Cov. Hopper | 140,000 | 29 3 | Steel | 52,000 | October | ..... | Amer. Car & Fdy. |
| | Hercules Powder Co. | 2 | Tank | 10,000g. | ..... | Alum. Tank | ..... | January | December | General American |
| | Home Gas Corp. | 3 | Tank | 100,000 | 35 2 1/2 | Steel | 69,160 | November | ..... | Amer. Car & Fdy. |
| | J. M. Huber Corp. | 3 | Cov. Hopper | 80,000 | 45 10 1/2 | Steel | 49,300 | August | ..... | Amer. Car & Fdy. |
| | Kosmos Portland Cement Co. | 10 | Cov. Hopper | 140,000 | 29 3 | Steel | 52,000 | August | ..... | Amer. Car & Fdy. |
| | Lone Star Producing Co. | 20 | Tank | 10,000g. | 33 8 1/2 | Steel Frame | 66,360 | October | Sept. '47 | Amer. Car & Fdy. |
| | Merchants Despatch Transport Corp. | 35 | Refrigerator | 80,000 | 27 8 | Steel | 72,300 | May | December | Despatch Shops |
| | | 500 | Refrigerator | 80,000 | 33 2 3/4 | Steel | 60,000 | May | Mar. '47 | Despatch Shops |
| | Monsanto Chemical Co. | 2* | Tank | 8,000g. | ..... | ..... | ..... | Dec. '45 | October | General American |
| | | 1 | Tank | 100,000 | 32 4 1/2 | Steel | 43,300 | July | ..... | Amer. Car & Fdy. |
| | | 1 | Tank | 8,000g. | ..... | ..... | ..... | February | June | General American |
| | | 1 | Tank | 4,000g. | ..... | ..... | ..... | February | December | General American |
| | | 8 | Tank | 7,000g. | ..... | ..... | ..... | July | Feb. '47 | General American |
| | | 3 | Tank | 80,000 | 25 9 | Composite | 44,000 | August | ..... | Amer. Car & Fdy. |
| | | 1 | Tank | 140,000 | 33 8 1/2 | Steel | 55,000 | September | ..... | Amer. Car & Fdy. |
| | | 1 | Cov. Hopper | 140,000 | 29 3 | Steel | 52,000 | November | ..... | Amer. Car & Fdy. |
| | Montana-Dakota Utilities Co. | 1 | Tank | 10,500g. | ..... | ..... | ..... | June | Jan. '47 | General American |
| | National Tube Co. | 3 | Flat | 80,000 | ..... | ..... | ..... | August | March '47 | Pressed Steel |
| | Niagara Alkali Co. | 6 | Tank | 80,000 | 30 7 | Steel | 60,500 | January | December | Amer. Car & Fdy. |
| | Northern Refrigerator Line | 50 | Refrigerator | 130,000 | 42 6 | Steel | 80,400 | April | October | Despatch Shops |
| | | 50 | Refrigerator | 130,000 | 42 6 | Steel | 80,400 | September | June '47 | Despatch Shops |
| | | 2 | Hopper | 100,000 | 33 0 | Steel | 41,500 | January | November | General American |
| | Ohio State University | 2 | Tank | 4,000g. | ..... | ..... | ..... | February | Feb. '47 | General American |
| | Oldbury Electrochemical Co. | 2 | Refrigerator | 80,000 | 33 2 3/4 | Steel Frame | 52,000 | May | Feb. to May '47 | Amer. Car & Fdy. |
| | Pacific Fruit Express | 500 | Refrigerator | 80,000 | 33 2 3/4 | Steel Frame | 52,000 | May | Apr. to July '47 | General American |
| | | 500 | Refrigerator | 80,000 | 33 2 3/4 | Steel Frame | 52,000 | May | Jan. to Apr. '47 | Pullman-Standard |
| | | 500 | Refrigerator | 80,000 | 33 2 3/4 | Steel Frame | 52,000 | May | Apr. to Aug. '47 | Parifac Car & Fdy. |
| | | 1,000 | Refrigerator | 80,000 | 33 2 3/4 | Steel Frame | 52,000 | August | June to Oct. '47 | Pressed Steel |
| | | 500 | Refrigerator | 80,000 | 33 2 3/4 | Steel Frame | 52,000 | August | Feb. to May '47 | Amer. Car & Fdy. |
| | | 500 | Refrigerator | 80,000 | 33 2 3/4 | Steel Frame | 52,000 | August | Apr. to July '47 | General American |
| | | 500 | Refrigerator | 80,000 | 33 2 3/4 | Steel Frame | 52,000 | August | Jan. to Apr. '47 | Pullman-Standard |
| | | 500 | Refrigerator | 80,000 | 33 2 3/4 | Steel Frame | 52,000 | August | Apr. to Aug. '47 | Pacific Car & Fdy. |
| | Pennsylvania Salt Mfg. Co. | 1* | Tank | 80,000 | ..... | Alum.-S.F. | ..... | Aug. '45 | October | Amer. Car & Fdy. |
| | | 3 | M. U. Tank | 80,000 | ..... | Steel | ..... | February | March | Amer. Car & Fdy. |
| | | 2 | Tank | 80,000 | ..... | Alum. | ..... | May | ..... | Amer. Car & Fdy. |
| | Pittsburgh Steel Co. | 2 | Gondola | 140,000 | ..... | ..... | ..... | May | Feb. '47 | Pressed Steel |
| | | 6 | Air Dump | 100,000 | 35 2 1/2 | Steel | 67,860 | August | May '47 | Pressed Steel |
| | Protane Corp. | 4 | Tank | 10,500g. | ..... | ..... | ..... | September | ..... | Amer. Car & Fdy. |
| | | 6 | Tank | 10,500g. | ..... | ..... | ..... | September | June '47 | General American |
| | Republic Steel Corp. | 5 | Air Dump | 140,000 | ..... | ..... | ..... | February | March '47 | Pressed Steel |
| | St. Louis Refrigerator Car Co. | 100 | Box | 80,000 | 40 0 | Composite | 54,300 | 1st half '46 | Dec. '46 to Ap. '47 | Company Shops |
| | Schenectady Varnish Co. | 1 | Tank | 8,000g. | ..... | ..... | ..... | February | September | General American |
| | Shawinigan Products Corp. | 4 | Tank | 8,000g. | ..... | ..... | ..... | June | April '47 | General American |
| | Shell Chemical Corp. | 19 | Tank | 100,000 | 35 2 1/2 | Steel | 66,000 | September | ..... | Amer. Car & Fdy. |
| | Shippers' Car Line Corp. | 40 | Tank | 80,000 | ..... | Steel | ..... | January | November | Amer. Car & Fdy. |
| | | 475 | Tank | ..... | ..... | Steel | ..... | February | ..... | Amer. Car & Fdy. |
| | | 100 | Cov. Hopper | 140,000 | 29 3 | Steel | 52,600 | February | ..... | Amer. Car & Fdy. |
| | | 5 | Tank | 80,000 | 25 2 1/2 | Steel | 38,300 | March | ..... | Amer. Car & Fdy. |
| | | 124 | Tank | 100,000 | 38 10 1/4 | Steel | ..... | May | ..... | Amer. Car & Fdy. |
| | | 270 | Tank | 80,000 | 30 7 | Steel | 60,500 | June | ..... | Amer. Car & Fdy. |
| | | 35 | Tank | ..... | ..... | Steel | ..... | July | ..... | Amer. Car & Fdy. |
| | | 170 | Tank | ..... | ..... | Steel | ..... | October | ..... | Amer. Car & Fdy. |
| | | 260 | Tank | 8,000g. | ..... | ..... | ..... | November | ..... | Amer. Car & Fdy. |
| | Thos. E. Snyder & Sons | 30 | Tank | 6,000g. | ..... | ..... | ..... | September | July '47 | General American |
| | | 2 | Tank | 110,000 | ..... | ..... | ..... | September | July '47 | General American |
| | Solvay Process Co. | 15 | Tank | 140,000 | 37 4 | Steel | 85,000 | November | April '47 | Harlan & Holl'sworth |
| | | 5 | Tank | 140,000 | 37 10 | Steel | 85,000 | November | ..... | Amer. Car & Fdy. |
| | Southern Alkali Corp. | 65 | Tank | 8,000g. | ..... | ..... | ..... | July | ..... | Amer. Car & Fdy. |
| | Stauffer Chemical Co. | 2 | Tank | 100,000 | ..... | Steel | 70,000 | September | July '47 | General American |
| | Sun Oil Co. | 100 | Tank | 100,000 | ..... | Steel | ..... | August | March '47 | Harlan & Holl'sworth |
| | Tennessee Copper Co. | 6 | Air Dump | 100,000 | ..... | ..... | ..... | May | March '47 | Pressed Steel |
| | | 8 | Air Dump | 100,000 | ..... | ..... | ..... | May | April '47 | Pressed Steel |
| | Tennessee Products Corp. | 1 | Tank | 8,000g. | ..... | ..... | ..... | August | April '47 | General American |
| | Union Carbide & Carbon Corp. | 2 | Hopper | 100,000 | 33 1/2 | Steel | 41,340 | May | ..... | Amer. Car & Fdy. |
| | Union Oil Co. of California | 12 | Tank | 12,500g. | ..... | ..... | ..... | November | July '47 | General American |
| | Union Tank Car Co. | 800 | Tank | 100,000 | 38 1 1/4 | Steel | 61,000 | June | Feb. '47 | Amer. Car & Fdy. |
| | | 100 | Tank | 100,000 | ..... | ..... | 72,800 | June | March-April '47 | General American |
| | | 100 | Tank | 100,000 | 38 10 1/4 | Steel | 65,000 | June | Feb. '47 | Amer. Car & Fdy. |
| | | 20 | Cov. Hopper | 100,000 | 45 10 1/2 | Steel | 50,800 | June | ..... | Amer. Car & Fdy. |
| | United Carbon Co. | 1 | Tank | 10,000g. | ..... | ..... | ..... | February | December | General American |
| | Hiram Walker & Sons, Ltd. | 15 | Tank | 100,000 | ..... | Steel | 68,000 | May | Jan. '47 | General American |
| | Warren Petroleum Corp. | 75 | Tank | 100,000 | ..... | Steel | 68,000 | June | Feb.-March '47 | General American |
| | | 75 | Tank | 100,000 | ..... | Steel | 68,000 | July | March '47 | General American |
| | | 100 | Tank | 100,000 | ..... | Steel | 68,000 | October | July '47 | General American |
| | | 75 | Tank | 100,000 | 33 8 1/2 | Steel | 68,000 | June | March '47 | Amer. Car & Fdy. |
| | | 90 | Tank | 100,000 | 33 8 1/2 | Steel | 68,000 | July | June '47 | Amer. Car & Fdy. |
| | | 100 | Tank | 100,000 | 33 8 1/2 | Steel | 68,000 | September | June '47 | Amer. Car & Fdy. |
| | Western Fruit Express | 50 | Refrigerator | 100,000 | 40 0 | ..... | ..... | April | 1947 | Company Shops |

| Purchaser | No. | Class | Capacity | Length ft. in. | Construction | Weight | Date of Order | Date of Delivery | Builder |
|-------------------------|-----|--------------|----------|-------------------|--------------|--------|------------------|---------------------|------------------|
| Wilson & Co. | 1 | Tank | 7,000g. | 36 0 | Steel Frame | 54,500 | July | March '47 | General American |
| Wilson Car Lines | 100 | Refrigerator | 80,000 | 36 0 | Steel | 54,500 | January | December | Company Shops |
| Witco Chemical Co. | 20 | Cov. Hopper | 100,000 | 45 10 1/4 | Steel | 52,200 | May | Jan. '47 | General American |

* Not listed last year.

United States—Export

| Purchaser | No. | Class | Capacity | Length ft. in. | Construction | Weight | Date of Order | Date of Delivery | Builder |
|---|--------|----------|----------|-------------------|--------------|--------|------------------|---------------------|------------------|
| American-Arabian Oil Co. | 80 | Flat | 100,000 | ... | ... | ... | November | July '47 | Pressed Steel |
| Anglo-Mexican Petroleum Corp. (For Brazil) | 38 | Tank | 80,000 | 35 10 | Steel | 53,730 | May | ... | Amer. Car & Fdy. |
| Argentine State Railways | 600 | Box | 70,000 | ... | ... | ... | November | ... | Pullman-Standard |
| | 100 | Cattle | 70,000 | 45 6 3/4 | S.U. | 36,600 | February | ... | Amer. Car & Fdy. |
| | 300 | Flat | 70,000 | 39 4 3/4 | Steel | 25,500 | February | ... | Amer. Car & Fdy. |
| Balfour, Guthrie & Co. | 4 | Tank | 6,500g. | 30 1 3/4 | Steel | 30,000 | July | ... | Amer. Car & Fdy. |
| Buenos Aires Pacifico | 60 | Tank | 100,000 | 37 5 | Steel | 55,600 | June | ... | Amer. Car & Fdy. |
| Canadian General Transit | 11 | Tank | 110,000 | ... | Steel | ... | March | Jan. '47 | General American |
| Canadian Industries, Ltd. | 5 | Tank | 100,000 | 34 1 | Alum. | 48,600 | February | ... | Amer. Car & Fdy. |
| Cia. Industrial Azucarera | 30 | Cane | 30,000 | ... | ... | ... | August | May '47 | Pressed Steel |
| Colombian Government | 18 | Tank | 6,000g. | ... | ... | ... | July | March '47 | General American |
| Colombian National Rys. | 170 | Gondola | 77,100 | 40 6 | Steel | 33,910 | April-Sept. | ... | Amer. Car & Fdy. |
| | 17 | Gondola | 55,100 | 40 6 | Steel | 31,030 | April-Sept. | ... | Amer. Car & Fdy. |
| | 246 | Box | 55,100 | 32 8 1/2 | Steel | 29,810 | July | ... | Amer. Car & Fdy. |
| | 112 | Stock | 55,100 | 32 8 1/2 | Steel | 30,160 | July | ... | Amer. Car & Fdy. |
| | 115 | Flat | 55,100 | 40 6 | Steel | 25,660 | July | ... | Amer. Car & Fdy. |
| Ecuadorian National Rys. | 8 | Tank | 6,000g. | ... | ... | ... | May | Feb. '47 | General American |
| Ferro Carril de Antioquia | 12 | Tank | 8,000g. | ... | ... | ... | January | Jan. '47 | General American |
| France | 3,500 | Box | 40,000 | 30 3 | ... | 27,200 | January | 1947 | General American |
| | 8,750 | Box | 40,000 | 30 3 | Steel | 26,000 | January | 1947 | Amer. Car & Fdy. |
| | 4,000 | Gondola | 60,000 | 25 3 1/2 | Steel | 21,750 | January | 1947 | Amer. Car & Fdy. |
| | 10,000 | Box | 40,000 | ... | ... | ... | January | 1946-'47 | Pullman-Standard |
| | 4,500 | Box | 40,000 | ... | ... | ... | January | 1946-'47 | Pressed Steel |
| | 3,000 | Gondola | 66,000 | 25 3 1/2 | Steel | 21,660 | January | 1946-'47 | Magor |
| | 3,000 | Gondola | 60,000 | 25 3 1/2 | S.U. | 20,850 | January | 1946-'47 | Greenville |
| | 100 | Stock | 72,000 | ... | ... | ... | February | March '47 | Pressed Steel |
| | 75 | Box | 40,000 | ... | ... | ... | March | December | Pressed Steel |
| | 75 | Flat | 56,000 | ... | ... | ... | March | December | Pressed Steel |
| | 4 | Tank | 2,000g. | ... | ... | ... | September | June '47 | General American |
| Gregg Co. | 20 | Cane | 30,000 | 13 7 1/4 | Steel | 13,831 | January | March | Amer. Car & Fdy. |
| | 25 | Tank | 6,600g. | 31 5 1/4 | Steel | 32,500 | February | February | Amer. Car & Fdy. |
| | 100 | Box | 60,000 | 34 0 | Steel | 13,600 | February | March | Amer. Car & Fdy. |
| | 10 | Tank | 4,000g. | 19 5 1/4 | Steel | 29,000 | February | March | Amer. Car & Fdy. |
| | 6 | Tank | 6,000g. | 26 3 3/4 | Steel | 32,000 | February | April | Amer. Car & Fdy. |
| | 4 | Tank | 6,600g. | 31 5 1/4 | Steel | 32,500 | February | ... | Amer. Car & Fdy. |
| | 9 | Tank | 6,000g. | 26 3 3/4 | Steel | 32,500 | February | ... | Amer. Car & Fdy. |
| | 10 | Tank | 8,000g. | 31 4 3/4 | Steel | 36,500 | February | ... | Amer. Car & Fdy. |
| | 8 | Tank | 10,000g. | 32 11 3/4 | Steel | 48,000 | February | ... | Amer. Car & Fdy. |
| Guayaquil & Quito | 9 | Tank | 60,000 | 29 2 1/2 | Steel | 30,000 | March | ... | Amer. Car & Fdy. |
| Iron Mines Co. of Venezuela | 20 | Ore | 140,000 | ... | ... | ... | March | November | Bethlehem Steel |
| | 2 | Box | 100,000 | ... | ... | ... | March | November | Bethlehem Steel |
| | 4 | Flat | 100,000 | ... | ... | ... | March | November | Bethlehem Steel |
| | 4 | Tank | 12,000g. | 36 2 | Steel | 48,000 | May | ... | Amer. Car & Fdy. |
| Maritrop Trading Corp. | 200 | Banana | 24,000 | 35 9 | Steel | 27,240 | November | June-July '47 | Magor |
| | 130 | Banana | 30,000 | ... | ... | ... | July | ... | Pullman-Standard |
| National Rys. of Mexico | 50 | Box | 100,000 | 40 6 | Steel | 59,000 | November | June '47 | Magor |
| Pressed Steel Car Co. | 2 | Tank | 10,000g. | ... | ... | ... | February | September | General American |
| | 20 | Tank | 7,930g. | ... | ... | ... | September | June '47 | General American |
| Rio Grande do Sul (Brazil) ... | 100 | Box | 72,000 | ... | ... | ... | February | March '47 | Pressed Steel |
| Standard Oil Co. of N. J. | 7 | Tank | 7,800g. | ... | ... | ... | May | Jan. '47 | General American |
| | 47 | Tank | ... | ... | ... | ... | September | June '47 | General American |
| | 25 | Tank | 10,000g. | ... | ... | ... | October | June '47 | General American |
| (For Sao Paulo Ry.) | 1 | Tank | 10,500g. | 37 0 | Steel | 74,300 | October | ... | Amer. Car & Fdy. |
| (For Central Ry. of Brazil) | 2 | Tank | 10,500g. | 37 0 | Steel | 74,300 | October | ... | Amer. Car & Fdy. |
| Sucesion de Falla Gut | 45 | Cane | 60,000 | 39 9 1/2 | Steel | 30,000 | May | ... | Amer. Car & Fdy. |
| Texas Co. | 1 | Tank | 60,000 | 30 1 1/2 | Steel | 30,000 | January | October | Amer. Car & Fdy. |
| (For Colombia) | 1 | Tank | 6,000g. | ... | ... | ... | August | March '47 | General American |
| Tropical Oil Co. | 38 | Tank | 6,000g. | 29 1 1/2 | Steel | ... | September | ... | Amer. Car & Fdy. |
| Union Oil Co. of Canada | 5 | Tank | 6,000g. | ... | ... | ... | July | March '47 | General American |
| United Fruit Co. | 12 | Tank | 7,500g. | ... | ... | ... | September | June '47 | General American |
| Danel Vela, S. A. | 10 | Tank | 10,500g. | ... | ... | ... | March | Jan. '47 | General American |
| Venezuelan Government | 10 | Air Dump | ... | ... | ... | ... | August | May '47 | Pressed Steel |
| Yeso el Tigre S. de R. L. de C. V. Mexico | 10 | Gondola | 30,000 | 34 0 | Steel | 30,000 | February | ... | Amer. Car & Fdy. |
| W. R. Grace & Co. | 90 | Box | 70,000 | 35 0 | Steel | 39,000 | January | ... | Amer. Car & Fdy. |
| | 32 | Cane | 35,000 | 22 10 1/2 | Steel | 15,500 | October | ... | Amer. Car & Fdy. |

Canada

| Purchaser | No. | Class | Capacity | Length ft. in. | Construction | Weight | Date of Order | Date of Delivery | Builder |
|---------------------------|-----|-------------|----------|-------------------|--------------|--------|------------------|---------------------|--------------------|
| Canadian Pacific | 1 | Cov. Hopper | 140,000 | 36 0 | Steel | ... | March | December | Company Shops |
| Ontario Northland | 75 | Hopper | 140,000 | 40 8 | Steel | 44,000 | February | December | National Steel Car |
| | 570 | Box | 80,000 | 40 6 | S.F. | 35,000 | December | April '47 | National Steel Car |
| Roberval & Saguenay | 30 | D.S. Box | 100,000 | 40 6 | ... | ... | November | April '47 | Dominion Steel |

Freight Cars Ordered, 1920-1946

(For Domestic Service)

| Year | Railroad and Private Line Shops | Contract Shops | Total | U. S. Export | Year | Railroad and Private Line Shops | Contract Shops | Total | U. S. Export |
|-----------|---------------------------------------|----------------|---------|-----------------|-----------|---------------------------------------|----------------|---------|-----------------|
| 1946..... | 12,784 | 44,947 | 57,731 | 39,999 | 1931..... | 5,831 | 4,366 | 10,197 | 150 |
| 1945..... | 10,305 | 27,950 | 38,255 | 10,563 | 1930..... | 11,918 | 31,487 | 43,405 | 838 |
| 1944..... | 12,545 | 41,936 | 54,481 | 9,755 | 1929..... | 12,903 | 97,238 | 110,141 | 2,610 |
| 1943..... | 11,487 | 25,543 | 37,030 | 44,646 | 1928..... | 10,115 | 38,039 | 48,154 | 1,873 |
| 1942..... | 7,956 | 20,604 | 28,560 | 37,840 | 1927..... | 12,380 | 60,611 | 72,991 | 118 |
| 1941..... | 27,389 | 79,508 | 106,897 | 11,024 | 1926..... | 11,364 | 50,206 | 61,570 | 1,449 |
| 1940..... | 17,233 | 48,595 | 65,828 | 1,996 | 1925..... | 8,946 | 77,639 | 86,585 | 1,497 |
| 1939..... | 14,527 | 39,388 | 53,915 | 1,510 | 1924..... | 9,299 | 136,317 | 145,616 | 2,734 |
| 1938..... | 2,029 | 14,342 | 16,371 | 422 | 1923..... | 11,111 | 84,498 | 95,609 | 780 |
| 1937..... | 15,231 | 34,711 | 49,942 | 1,291 | 1922..... | 6,783 | 171,427 | 178,210 | 1,467 |
| 1936..... | 14,415 | 55,333 | 69,748 | 41 | 1921..... | 894 | 21,871 | 22,765 | 4,123 |
| 1935..... | 8,061 | 10,688 | 18,749 | 403 | 1920..... | 6,177 | 73,963 | 80,140 | 5,578 |
| 1934..... | 7,934 | 16,637 | 24,571 | 1,323 | | | | | |
| 1933..... | 741 | 979 | 1,720 | 167 | | | | | |
| 1932..... | 1,612 | 339 | 1,951 | 25 | | | | | |

Source: 1946—Railway Age; all other—American Railway Car Institute.

Passenger-Car Orders for Year Total 1,986

ACCORDING to reports received by *Railway Age*, 1,930 passenger-train cars for domestic service were ordered during 1946 and 56 for export. Of the 1,930 cars, 1,430 were ordered by the railroads, while 500 express refrigerator cars are for the Railway Express Agency. The 56 cars for export include 16 for the National Railways of Mexico and 40 for the Colombian National Railways.

There were 1,331 cars delivered for domestic service in 1946, including 879 troop sleepers, and 35 cars were completed for export, despite materials shortages and labor unrest during the year.

The Canadian National ordered 30 cars in 1946 which are to be built in Canada. Also, 30 hospital cars, 5 coaches, and one baggage car are to be rebuilt for the Alaska railroad by the International Car & Mfg. Co.

The cars ordered last year are listed by railroads in the accompanying table, and a summary and analysis of orders and deliveries from 1920 through last year appears also. More detailed information on how the railroads plan to use the equipment on-order may be found on pages 797 through 803 of the November 16, 1946 (Passenger Progress) issue of *Railway Age*.

Luxury of appointments and the last word in modern interior facilities, as well as light-weight superstructures and sound-proofed trucks will characterize the more than 1,900 passenger cars orders by the railroads during the past year. In achieving light weight, and because of the fact that passenger comfort demands more and more in the way of electrical and air-conditioning equipment, most of the new cars embody the

By **ELAINE C. FARRAR**
Editorial Assistant

use of special materials such as stainless steel-high-tensile low-alloy steel and aluminum.

A substantial proportion of the cars ordered in 1946 are for service in many of the "named" trains and the sleeping car equipment will be used to

replace the standard sleepers now in service.

Among the passenger cars ordered are 447 full coaches, 104 straight diners, 25 lounge cars and 476 straight sleepers. Other cars on order include combinations of various types.

The detailed list of orders was compiled from reports to *Railway Age* by the railroads, checked and amplified with data received from the car builders through the cooperation and assistance of the American Railway Car Institute.



Henry Dreyfuss, industrial designer, choosing paintings for 213 day coaches he has designed for the New York Central. Paintings will be mounted two to a coach

| Passenger-Train Cars Ordered, 1920-1946 | | | | | | | Passenger-Train Cars Delivered | | | | |
|---|-----------|-------------------------------|-----------|-------------------------------|-----------------|----------------|--------------------------------|-----------|----------------------|--------------|-------|
| Year | Railroad | | Contract | | | Total Domestic | U. S. Export | Year | For Domestic Service | U. S. Export | Total |
| | Passenger | Express Refrigerator and milk | Passenger | Express Refrigerator and Milk | Pullman Company | | | | | | |
| 1946..... | 191 | ... | 1,239 | 500 | ... | 1,930 | 56 | 1946..... | 1,331 | 35 | 1,366 |
| 1945..... | 100 | ... | 2,873 | 25 | ... | 2,998 | 49 | 1945..... | 856 | .. | 856 |
| 1944..... | ... | ... | 715 | .. | ... | 715 | 374 | 1944..... | 995 | .. | 995 |
| 1943..... | ... | ... | 1,670 | .. | ... | 1,670 | ... | 1943..... | 675 | 21 | 696 |
| 1942..... | ... | ... | 34 | .. | ... | 34 | ... | 1942..... | 393 | 11 | 404 |
| 1941..... | 31 | ... | 318 | .. | 197 | 546 | 27 | 1941..... | 363 | 14 | 377 |
| 1940..... | 6 | ... | 311 | .. | 53 | 370 | 21 | 1940..... | 250 | 28 | 278 |
| 1939..... | ... | ... | 194 | .. | 125 | 319 | 28 | 1939..... | 273 | .. | 273 |
| 1938..... | 82 | ... | 102 | .. | 84 | 268 | ... | 1938..... | 420 | 4 | 420 |
| 1937..... | 40 | 30 | 243 | 80 | 171 | 564 | ... | 1937..... | 621 | .. | 621 |
| 1936..... | 50 | ... | 397 | .. | 1 | 448 | ... | 1936..... | 189 | .. | 189 |
| 1935..... | 6 | ... | 55 | 55 | 10 | 126 | ... | 1935..... | 202 | .. | 202 |
| 1934..... | 95 | ... | 318 | .. | 8 | 421 | 15 | 1934..... | 275 | 15 | 290 |
| 1933..... | 2 | ... | 11 | .. | 3 | 16 | ... | 1933..... | 9 | .. | 9 |
| 1932..... | 5 | ... | 32 | 2 | ... | 39 | ... | 1932..... | 39 | .. | 39 |
| 1931..... | 5 | ... | 5 | .. | 1 | 11 | 21 | 1931..... | 243 | 21 | 264 |
| 1930..... | 41 | 50 | 486 | .. | 102 | 679 | 15 | 1930..... | 1,520 | 40 | 1,560 |
| 1929..... | 84 | 305 | 1,176 | 200 | 550 | 2,315 | 108 | 1929..... | 2,419 | 128 | 2,547 |
| 1928..... | 133 | 80 | 980 | 850 | 244 | 2,287 | 35 | 1928..... | 1,549 | 121 | 1,670 |
| 1927..... | 86 | 25 | 1,293 | 20 | 118 | 1,542 | 47 | 1927..... | 2,007 | 42 | 2,049 |
| 1926..... | 62 | 45 | 1,321 | 40 | 519 | 1,987 | ... | 1926..... | 2,798 | 111 | 2,909 |
| 1925..... | 44 | 50 | 1,527 | 40 | 479 | 2,140 | 68 | 1925..... | 2,312 | 42 | 2,354 |
| 1924..... | 49 | 62 | 1,582 | 310 | 701 | 2,704 | 25 | 1924..... | 2,332 | 54 | 2,386 |
| 1923..... | 30 | 86 | 1,064 | 587 | 424 | 2,191 | 5 | 1923..... | 1,888 | 45 | 1,933 |
| 1922..... | 37 | ... | 1,843 | 245 | 300 | 2,425 | 10 | 1922..... | 908 | 156 | 1,064 |
| 1921..... | 1 | 50 | 157 | .. | 100 | 308 | 145 | 1921..... | 1,162 | 49 | 1,211 |
| 1920..... | 33 | 30 | 1,082 | 10 | 458 | 1,613 | 114 | 1920..... | 751 | 135 | 886 |

Source: 1946—*Railway Age*; all other—American Railway Car Institute.

Source: American Railway Car Institute—1946 figures include an estimate for the last half of December.

Passenger-Train Cars Ordered—1946

| Purchaser | No. | Class | Length Ft. In. | Construction | Seating Capacity | Weight | Date of Order | Date of Delivery | Builder |
|--|-----|-----------------------|-------------------|---------------|---------------------|---------|------------------|---------------------|------------------|
| Atchison, Topeka & Santa Fe..... | 12 | Chair | 82 10 | H. S. Steel | 1.. | ..... | April | ..... | Pullman-Standard |
| Atlanta & West Point..... | 1 | Bed.-roomette | 85 0 | Alum. | 25 | 146,000 | August | Nov. '47 | Pullman-Standard |
| | 1 | Bed.-obs. | 85 0 | Alum. | 25 | 146,000 | August | Nov. '47 | Pullman-Standard |
| | 1 | Diner | 85 0 | Alum. | 44 | 149,500 | August | Sept. '47 | Budd |
| Atlantic Coast Line..... | 2 | Coach | 85 0 | Steel | 52 | 124,300 | August | Sept. '47 | Budd |
| | 6 | Bed, Bar, Lnge. | 85 0 | Steel | 36 | 136,500 | June | Apr.-June '47 | Amer. Car & Fdy. |
| | 6 | Bed, Roomette | 85 0 | Steel | 20 | 138,500 | June | Apr.-June '47 | Amer. Car & Fdy. |
| | 2* | Baggage | 85 0 | Steel | .. | 122,000 | June | Apr.-June '47 | Amer. Car & Fdy. |
| | 25 | Bed, Roomette | 85 0 | Steel | 22 | 140,600 | June | July-Dec. '47 | Pullman-Standard |
| | 5 | Roomette | 85 0 | Steel | 21 | 142,000 | June | July-Dec. '47 | Pullman-Standard |
| | 10 | Diner | 85 0 | Steel | 36 | 143,000 | June | July-Dec. '47 | Pullman-Standard |
| | 20 | Coach | 85 0 | Steel | 54 | 128,300 | June | July-Dec. '47 | Pullman-Standard |
| Baltimore & Ohio..... | 2 | Combine | 82 10 | Steel | 16 | 122,570 | Dec. '45* | June '47 | Pullman-Standard |
| | 8 | Coach | 82 10 | Steel | 56 | 467,536 | Dec. '45* | June '47 | Pullman-Standard |
| | 2 | Diner | 82 10 | Steel | 38 | 134,950 | Dec. '45* | June '47 | Pullman-Standard |
| | 2 | Strata Dome Coach | 82 10 | Steel | 42 | 127,500 | Dec. '45* | June '47 | Pullman-Standard |
| | 2 | Tav.-Obs. | 83 3½ | Steel | 24 | 119,180 | Dec. '45* | June '47 | Pullman-Standard |
| Canadian National..... | 30 | Coach | 82 8½ | Steel | 60 | 135,000 | January | Apr. '47 | Can. Car & Fdy. |
| Chicago Great Western..... | 3* | Baggage | 70 8 | Steel | .. | 90,000 | February | Nov. '46 | Pullman-Standard |
| Chicago, Milwaukee, St. Paul & Pacific | 28 | Sleeping | .. | .. | .. | .. | February | 1947 | Pullman-Standard |
| | 18 | Coach | .. | .. | .. | .. | 1946 | 1947 | Company Shops |
| | 6 | Coach | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 6 | Bag.-Dorm. | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 12 | Tourist | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 8 | Lounge-Lunch. | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 6 | Diner | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 6* | Mail-Exp. | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 20* | Baggage | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 17* | Mail-Exp. | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 2* | R. P. O. | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 2 | Bag.-Dorm. | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 57 | Coach | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 11 | Chair | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 6 | Chair-Cafe | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 4 | Tap-Diner | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| | 6 | Diner | .. | .. | .. | .. | 1946 | 1947 | Company Shop |
| Chesapeake & Ohio..... | 10 | Coach-Lnge. | 85 0 | St. Steel | 44 | 118,500 | January | Mar.-Apr. '47 | Budd |
| | 3 | Coach-Bag. | 85 0 | St. Steel | 28 | 118,100 | January | Mar.-Apr. '47 | Budd |
| | 3 | Lunch Ctr. Diner-Obs. | 85 0 | St. Steel | 45 | 127,500 | January | Mar.-Apr. '47 | Budd |
| | 97 | Sleeping | 85 0 | H. S. Steel | .. | .. | November | Oct. '47 | Pullman-Standard |
| | 80 | Coach | 85 0 | H. S. Steel | .. | .. | November | Oct. '47 | Pullman-Standard |
| | 22 | Coach-Bag. | 85 0 | H. S. Steel | .. | .. | November | Oct. '47 | Pullman-Standard |
| | 7 | Kitchen-Diner | 85 0 | H. S. Steel | .. | .. | November | Oct. '47 | Pullman-Standard |
| | 4 | Buffet-Tab.-Obs. | 85 0 | H. S. Steel | .. | .. | November | Oct. '47 | Pullman-Standard |
| | 14 | Kitchen-Crew | 85 0 | H. S. Steel | .. | .. | November | Oct. '47 | Pullman-Standard |
| Chicago & North Western..... | 14 | Diner | 85 0 | H. S. Steel | .. | .. | November | Oct. '47 | Pullman-Standard |
| | 36 | Coach | 82 10 | H. S. Steel | .. | .. | August | ..... | Pullman-Standard |
| | 1 | Diner | 82 10 | H. S. Steel | .. | .. | August | ..... | Pullman-Standard |
| | 1 | Cafe-Coach | 82 10 | H. S. Steel | .. | .. | August | ..... | Pullman-Standard |
| | 4 | Bar-Diner-Lnge. | 82 10 | H. S. Steel | .. | .. | August | ..... | Pullman-Standard |
| | 4 | Bag-Mail | 70 3 | H. S. Steel | .. | .. | August | ..... | Pullman-Standard |
| | 2* | Mail-Stor. | 85 0 | Alum. | .. | .. | March | ..... | Amer. Car & Fdy. |
| | 1* | Mail-Bag. | 85 0 | Alum. | .. | .. | March | ..... | Amer. Car & Fdy. |
| | 3* | Bag.-Dorm. | 85 0 | Alum. | .. | .. | March | ..... | Amer. Car & Fdy. |
| | 2 | Lunch Cur.-Diner | 85 0 | Alum. | 37 | .. | March | ..... | Amer. Car & Fdy. |
| | 1 | Cafe-Lnge. | 85 0 | Alum. | 52 | .. | March | ..... | Amer. Car & Fdy. |
| | 4 | Diner | 85 0 | Alum. | 48 | .. | March | ..... | Amer. Car & Fdy. |
| | 3 | Club-Lnge. | 85 0 | Alum. | 37 | .. | March | ..... | Amer. Car & Fdy. |
| Chicago & Northwestern Railway Co. | 1 | Sleeping | 85 0 | Alum. & Steel | 22 | .. | May | ..... | Amer. Car & Fdy. |
| | 2 | Sleeping | 85 0 | Alum. & Steel | 24 | .. | May | ..... | Amer. Car & Fdy. |
| | 1 | Sleeping | 85 0 | Alum. & Steel | 20 | .. | May | ..... | Amer. Car & Fdy. |
| Chicago, Rock Island & Pacific..... | 1 | Roomette | 82 10 | H. S. Steel | 22 | 134,000 | March | May-June '47 | Pullman-Standard |
| | 2 | Bed-Sleeper | 82 10 | H. S. Steel | 24 | 129,000 | March | May-June '47 | Pullman-Standard |
| | 1 | Bed-Compt. | 82 10 | H. S. Steel | 20 | 125,000 | March | May-June '47 | Pullman-Standard |
| Columbian National Railway..... | 21* | Coach | 50 7 | Steel | 48 | 38,000 | July | ..... | Amer. Car & Fdy. |
| | 19* | Coach | 50 7 | Steel | 48 | 38,000 | July | ..... | Amer. Car & Fdy. |
| Delaware, Lackawanna & Western.. | 15 | Coach | 82 5 | H. S. Steel | 62 | 129,000 | August | Apr.-June '47 | Amer. Car & Fdy. |
| | 6 | Sleeper | 82 5 | H. S. Steel | 22 | 130,500 | June | Apr.-June '47 | Amer. Car & Fdy. |
| | 3 | Sleeper | 82 5 | H. S. Steel | 22 | 130,500 | October | Apr.-June '47 | Amer. Car & Fdy. |
| | 2 | Diner | 82 5 | St. Steel | 36 | 140,600 | August | July-Sept. '47 | Budd |
| | 2 | Tavern-Obs. | 82 5 | St. Steel | .. | 122,000 | August | July-Sept. '47 | Budd |
| Erie..... | 7 | Sleeping | 79 3 | Steel | 30 | 137,800 | March | Sept. '47 | Pullman-Standard |
| Florida East Coast..... | 7 | Bed-Roomette | 85 0 | Steel | 22 | 140,621 | June | ..... | Pullman-Standard |
| | 5 | Bed-Roomette | 85 0 | Steel | 22 | 150,772 | June | ..... | Pullman-Standard |
| | 2 | Roomette | 85 0 | Steel | 21 | 142,003 | June | ..... | Pullman-Standard |
| | 2 | Bed-Bar-Lnge. | 85 0 | Steel | 36 | 139,050 | June | ..... | Pullman-Standard |
| | 5 | Coaches | 85 0 | Steel | 54 | 128,348 | June | ..... | Pullman-Standard |
| | 2 | Diner | 85 0 | Steel | 36 | 140,879 | June | ..... | Pullman-Standard |
| | 1 | Bed-Obs. | 85 0 | Steel | 35 | 147,771 | June | ..... | Pullman-Standard |
| | 1 | Bed-Roomette | 85 0 | Steel | 20 | 138,500 | June | ..... | Amer. Car & Fdy. |
| | 1 | Bed-Bar-Lnge. | 85 0 | Steel | 36 | 144,050 | June | ..... | Amer. Car & Fdy. |
| | 1* | Baggage | 85 0 | Steel | .. | 122,000 | June | ..... | Amer. Car & Fdy. |
| | 1 | Feature | 85 0 | Steel | 56 | 136,600 | June | ..... | Budd |
| Great Northern..... | 4 | Baggage | 74 4½ | Steel | .. | 100,000 | March | May '47 | Company Shop |
| | 3* | Bag-Mail | 85 0 | Steel | .. | 112,000 | May | July-Sept. '47 | Amer. Car & Fdy. |
| | 7 | Coach | 85 0 | Steel | 60 | 120,000 | May | July-Sept. '47 | Amer. Car & Fdy. |
| | 2 | Lounge | 85 0 | Steel | 32 | 130,000 | May | July-Sept. '47 | Amer. Car & Fdy. |
| | 2* | Coach-Cafe | 85 0 | Steel | 52 | 130,000 | May | July-Sept. '47 | Amer. Car & Fdy. |
| | 1 | Chair-Cafe | 85 0 | Steel | 40 | 130,000 | May | July-Sept. '47 | Amer. Car & Fdy. |
| | 1 | Business | 85 0 | Steel | .. | .. | May | April '47 | Pullman-Standard |
| Illinois Central..... | 1 | Tav.-Coach-Crew | 85 0 | Steel | 40 | 129,800 | April | May '47 | Pullman-Standard |
| | 1 | Diner | 85 0 | Steel | 48 | 135,700 | April | May '47 | Pullman-Standard |
| | 1 | Chair-Bar-Lnge. | 85 0 | Steel | 37 | 123,500 | April | May '47 | Pullman-Standard |
| | 1 | Chair-Obs. | 85 0 | Steel | 36 | 121,000 | April | May '47 | Pullman-Standard |
| Kansas City Southern..... | 2* | Mail-Bag.-Dorm | 85 0 | Alum.-Steel | .. | 118,800 | January | July-Sept. '47 | Amer. Car & Fdy. |
| | 2 | Div.-Coach | 85 0 | Alum.-Steel | 67 | 106,150 | January | July-Sept. '47 | Amer. Car & Fdy. |
| | 4 | Coach | 85 0 | Alum.-Steel | 65 | 106,150 | January | July-Sept. '47 | Amer. Car & Fdy. |
| | 2 | Diner | 85 0 | Alum.-Steel | 36 | 114,700 | March | July-Sept. '47 | Amer. Car & Fdy. |
| | 8 | Bed-Roomette | 85 0 | Alum.-Steel | .. | 129,000 | February | July-Sept. '47 | Pullman-Standard |
| Missouri Pacific..... | 4 | Sleeping | 85 0 | St. Steel | 22 | 115,000 | May | ..... | Budd |
| | 1* | Bag-Mail | 85 0 | H. S. Steel | .. | .. | November | ..... | Amer. Car & Fdy. |
| National Railways of Mexico..... | 12* | Coach | 78 0 | H. S. Steel | .. | .. | September | ..... | Pullman-Standard |
| | 4* | Mail-Exp. | 60 2 | Steel | .. | .. | September | ..... | Amer. Car & Fdy. |
| New York, Chicago & St. Louis.... | 15 | Sleeping | 85 0 | H. S. Steel | .. | .. | November | Oct. '47 | Pullman-Standard |
| | 5 | Coach | 85 0 | H. S. Steel | .. | .. | November | Oct. '47 | Pullman-Standard |
| New York, New Haven & Hartford. | 27 | Sleeping | 82 10 | H. S. Steel | .. | 144,000 | October | Dec. '47 | Pullman-Standard |

** Not listed last year. * Not air-conditioned.

Passenger-Train Cars Ordered—1946

| Purchaser | No. | Class | Length Ft. In. | Construction | Seating Capacity | Weight | Date of Order | Date of Delivery | Builder |
|------------------------------------|-----|-----------------------|-------------------|-----------------------|---------------------|---------|------------------|---------------------|------------------|
| Norfolk & Western..... | 2 | Coach-Locker | 85 0 | Steel | 40 | 129,273 | April | May '47 | Pullman-Standard |
| | 2 | Compt.-Coach | 85 0 | Steel | 66 | 131,022 | April | May '47 | Pullman-Standard |
| | 10 | Coach | 85 0 | Steel | 58 | 129,878 | April | May '47 | Pullman-Standard |
| | 2 | Lnge.-Tav.-Obs. | 85 0 | Steel | 16 | 130,793 | April | May '47 | Pullman-Standard |
| | 2 | Diner | 85 0 | Steel | 36 | 136,277 | April | May '47 | Pullman-Standard |
| | 3 | Sleeping | 85 0 | Steel | 22 | 141,505 | June | June '47 | Pullman-Standard |
| Pennsylvania..... | 50 | Sleeping | 85 0 | Steel | 21 | ..... | January | July '47 | Budd |
| | 7 | Sleeping | 85 0 | Steel | 21 | ..... | January | May '47 | Amer. Car & Fdy. |
| | 33 | Sleeping | 85 0 | Steel | 22 | ..... | January | June '47 | Pullman-Standard |
| | 24 | Sleeping | 85 0 | Steel | 20 | ..... | January | July '47 | Pullman-Standard |
| | 15 | Sleeping | 85 0 | Steel | 22 | ..... | January | Apr. '47 | Amer. Car & Fdy. |
| | 11 | Sleep.-Buf. Lnge. | 85 0 | Steel | 12 | ..... | January | Aug. '47 | Pullman-Standard |
| | 8 | Sleep.-Bar Lnge. | 85 0 | Steel | 6 | ..... | January | Aug. '47 | Pullman-Standard |
| | 2 | Sleep.-Buf.-Obs. | 85 0 | Steel | 6 | ..... | January | Aug. '47 | Pullman-Standard |
| | 7 | Sleep.-Bug.-Obs. | 85 0 | Steel | 10 | ..... | January | Aug. '47 | Pullman-Standard |
| | 2 | Sleep.-Sec.-Buf. | 85 0 | Steel | 6 | ..... | January | Aug. '47 | Pullman-Standard |
| | 5 | Diner | 85 0 | Steel | 68 | ..... | January | May '47 | Amer. Car & Fdy. |
| | 5 | Kitchen-Dorm. | 85 0 | Steel | ..... | ..... | January | May '47 | Amer. Car & Fdy. |
| | 6 | Diner | 85 0 | Steel | 68 | ..... | January | Aug. '47 | Budd |
| | 6 | Kitchen-Dorm. | 85 0 | Steel | ..... | ..... | January | Aug. '47 | Budd |
| | 6 | Diner | 85 0 | Steel | 48 | ..... | January | Aug. '47 | Budd |
| | 21 | Coach-Bar-Lnge. | 85 0 | Steel | 28 | ..... | January | Aug. '47 | Budd |
| | 21 | Coach | 85 0 | Steel | 44 | 140,000 | January | May '47 | Amer. Car & Fdy. |
| | 4 | Bag.-Dorm. | 85 0 | Steel | ..... | ..... | January | May '47 | Amer. Car & Fdy. |
| | 6 | Sleeping | 85 0 | Steel | 22 | ..... | March | Sept. '47 | Budd |
| | 4 | Sleeping | 85 0 | Steel | 22 | ..... | May | May '47 | Amer. Car & Fdy. |
| | 2 | Sleeping | 85 0 | Steel | 22 | ..... | May | May '47 | Pullman-Standard |
| | 6 | Sleeping | 85 0 | Steel | 22 | ..... | June | Dec. '47 | Pullman-Standard |
| | 2 | Sleeping | 85 0 | Steel | 21 | ..... | June | Oct. '47 | Pullman-Standard |
| | 2 | Sleeping | 85 0 | Steel | 18 | ..... | June | May '47 | Amer. Car & Fdy. |
| | 2 | Coach | 85 0 | Steel | 44 | 140,000 | June | Oct. '47 | Pullman-Standard |
| | 3 | Special Lnge. | 85 0 | Steel | ..... | ..... | July | May '47 | Amer. Car & Fdy. |
| | 8 | Sleeping | 85 0 | Steel | 22 | ..... | August | Dec. '47 | Pullman-Standard |
| Pere Marquette..... | 16 | Coach | 85 0 | H. S. Steel | ..... | ..... | November | Oct. '47 | Pullman-Standard |
| | 4 | Chair | 85 0 | H. S. Steel | ..... | ..... | November | Oct. '47 | Pullman-Standard |
| | 3 | Kitchen-Diner | 85 0 | H. S. Steel | ..... | ..... | November | Oct. '47 | Pullman-Standard |
| | 3* | Mail-Bag. | 85 0 | H. S. Steel | ..... | ..... | November | Oct. '47 | Pullman-Standard |
| | 2 | Tav.-Lnge.-Lunch Ctr. | 85 0 | H. S. Steel | ..... | ..... | November | Oct. '47 | Pullman-Standard |
| | 2 | Lunch-Buf.-Bar | 85 0 | H. S. Steel | ..... | ..... | November | Oct. '47 | Pullman-Standard |
| Railway Express Agency..... | 500 | Exp. Refr. | 54 6 | Steel | ..... | 75,500 | November | May '47 | Amer. Car & Fdy. |
| Reading..... | 8* | M. U. Suburban | 72 11½ | Steel-Alum. | 86 | 150,000 | August | Aug. '47 | Amer. Car & Fdy. |
| Richmond, Fredericksburg & Potomac | 10 | Bed-Roomette | 85 0 | H. S. Steel | 22 | 140,600 | March | July-Sept. '47 | Pullman-Standard |
| | 1 | Roomette | 85 0 | H. S. Steel | 21 | 142,000 | June | July-Sept. '47 | Pullman-Standard |
| | 1 | Diner | 85 0 | H. S. Steel | 36 | 143,000 | June | July-Sept. '47 | Pullman-Standard |
| | 3 | Coach | 85 0 | H. S. Steel | 54 | 121,000 | June | July-Sept. '47 | Pullman-Standard |
| | 1 | Bed.-Bar-Lnge. | 85 0 | H. S. Steel | ..... | 136,000 | June | Oct.-Dec. '47 | Amer. Car & Fdy. |
| | 1 | Bed.-Roomette | 85 0 | H. S. Steel | 20 | 138,500 | June | Oct.-Dec. '47 | Amer. Car & Fdy. |
| St. Louis, San Francisco..... | 1 | Sleeper | 82 10 | H. S. Steel | ..... | ..... | February | ..... | Pullman-Standard |
| Seaboard Air Line..... | 13 | Sleeping | 85 0 | St. Steel | 22 | 132,798 | March | 1947 | Pullman-Standard |
| | 3 | Sleeping | 85 0 | St. Steel | 35 | 131,600 | March | 1947 | Amer. Car & Fdy. |
| | 6 | Sleeping | 85 0 | St. Steel | 22 | 115,000 | March | 1947 | Budd |
| Southern..... | 2* | Mail-Bag. | 85 0 | H. S. Steel | ..... | 158,000 | August | Oct.-Dec. '47 | Pullman-Standard |
| | 29 | Bed.-Roomette | 85 0 | H. S. Steel | 16 | 150,000 | August | Oct.-Dec. '47 | Pullman-Standard |
| | 11 | Bed.-Roomette | 85 0 | H. S. Steel | 18 | 151,000 | August | Oct.-Dec. '47 | Pullman-Standard |
| | 3 | Bed.-Obs. | 85 0 | H. S. Steel | ..... | 148,000 | August | Oct.-Dec. '47 | Pullman-Standard |
| | 4 | Bed.-Lnge. | 85 0 | H. S. Steel | ..... | 145,000 | August | Oct.-Dec. '47 | Pullman-Standard |
| | 7 | Diner | 85 0 | H. S. Steel | 44 | 159,000 | August | July-Sept. '47 | Budd |
| | 19 | Coach | 85 0 | H. S. Steel | 52 | 133,000 | August | July-Sept. '47 | Budd |
| | 6 | Coach-Lnge. | 85 0 | H. S. Steel | 34 | 140,000 | August | July-Sept. '47 | Budd |
| | 2 | Bag.-Dorm | 85 0 | H. S. Steel | ..... | 166,000 | August | July-Sept. '47 | Amer. Car & Fdy. |
| | 2 | Lnge.-Bar | 85 0 | Alum. | ..... | 140,000 | August | July-Sept. '47 | Amer. Car & Fdy. |
| | 2 | Diner | 85 0 | Alum. | 44 | 157,000 | August | July-Sept. '47 | Amer. Car & Fdy. |
| | 11 | Coach | 85 0 | Alum. | 52 | 131,000 | August | July-Sept. '47 | Amer. Car & Fdy. |
| | 3* | Mail-Bag. | 85 0 | Alum. | ..... | 159,000 | August | July-Sept. '47 | Amer. Car & Fdy. |
| Southern Pacific..... | 3* | Bag.-Part. | 82 10 | Alum. and H. S. Steel | ..... | 129,336 | June | July-Dec. '47 | Pullman-Standard |
| | 2 | Chair | 82 10 | Alum. and H. S. Steel | 46 | 123,980 | June | July-Dec. '47 | Pullman-Standard |
| | 2 | Chair | 82 10 | Alum. and H. S. Steel | 38 | 124,014 | June | July-Dec. '47 | Pullman-Standard |
| | 14 | Chair | 82 10 | Alum. and H. S. Steel | 48 | 123,581 | June | July-Dec. '47 | Pullman-Standard |
| | 2 | Coffee Shop | 70 1 | Alum. and H. S. Steel | 66 | 99,340 | June | July-Dec. '47 | Pullman-Standard |
| | 2† | Kitchen | 57 4 | Alum. and H. S. Steel | ..... | 108,705 | June | July-Dec. '47 | Pullman-Standard |
| | 2 | Dining | 70 1 | Alum. and H. S. Steel | 66 | 98,931 | June | July-Dec. '47 | Pullman-Standard |
| | 2 | Tavern | 82 10 | Alum. and H. S. Steel | 54 | 123,299 | June | July-Dec. '47 | Pullman-Standard |
| | 2 | Kitchen | 70 1 | H. S. Steel | ..... | 121,440 | June | July-Dec. '47 | Pullman-Standard |
| | 2† | Dining | 57 4 | H. S. Steel | 44 | 88,634 | June | July-Dec. '47 | Pullman-Standard |
| | 2 | Lounge | 70 1 | H. S. Steel | 42 | 113,882 | June | July-Dec. '47 | Pullman-Standard |
| | 4 | Dining | 82 10 | H. S. Steel | 48 | 133,296 | June | July-Dec. '47 | Pullman-Standard |
| | 2 | Lounge | 82 10 | H. S. Steel | 39 | 126,382 | June | July-Dec. '47 | Pullman-Standard |
| | 3 | Dining | 82 10 | H. S. Steel | 36 | 132,678 | June | July-Dec. '47 | Pullman-Standard |
| | 4 | Coffee Shop | 82 10 | H. S. Steel | 46 | 135,653 | June | July-Dec. '47 | Pullman-Standard |
| | 1* | Bag.-Dorm. | 82 10 | H. S. Steel | ..... | 120,605 | June | July-Dec. '47 | Pullman-Standard |
| | 3 | Chair | 82 10 | H. S. Steel | 44 | 125,270 | June | July-Dec. '47 | Pullman-Standard |
| Spokane, Portland & Seattle..... | 1 | Coach | 82 10 | H. S. Steel | 1.. | ..... | September | ..... | Pullman-Standard |
| | 1 | Sleeping | 82 10 | H. S. Steel | 1.. | ..... | September | ..... | Pullman-Standard |
| Union Pacific..... | 11 | Bag.-Mail-Storage | 85 0 | Alum.-Steel | ..... | ..... | February | July-Sept. '47 | Amer. Car & Fdy. |
| | 3 | R. P. O. | 85 0 | Alum.-Steel | ..... | ..... | February | July-Sept. '47 | Amer. Car & Fdy. |
| | 3 | R. P. O. | 85 0 | Alum.-Steel | ..... | ..... | February | July-Sept. '47 | Amer. Car & Fdy. |
| | 9 | Bag.-Dorm. | 85 0 | Alum.-Steel | ..... | ..... | February | July-Sept. '47 | Amer. Car & Fdy. |
| | 10 | Lunch Ctr.-Diner | 85 0 | Alum.-Steel | ..... | ..... | February | July-Sept. '47 | Amer. Car & Fdy. |
| | 3 | Cafe-Lnge. | 85 0 | Alum.-Steel | ..... | ..... | February | July-Sept. '47 | Amer. Car & Fdy. |
| | 11 | Diner | 85 0 | Alum.-Steel | ..... | ..... | February | July-Sept. '47 | Amer. Car & Fdy. |
| | 6 | Dorm.-Club | 85 0 | Alum.-Steel | ..... | ..... | February | July-Sept. '47 | Amer. Car & Fdy. |
| | 9 | Club-Lnge. | 85 0 | Alum.-Steel | ..... | ..... | February | July-Sept. '47 | Amer. Car & Fdy. |
| | 15 | Sleeping | 85 0 | Alum.-Steel | ..... | ..... | February | July-Sept. '47 | Amer. Car & Fdy. |
| Wabash..... | 4 | Bed.-Roomette | 85 0 | Alum.-Steel | 20 | 133,000 | May | Apr.-June '47 | Amer. Car & Fdy. |
| | 4 | Coach | 85 0 | Alum.-Steel | 55 | 124,000 | August | Apr.-June '47 | Amer. Car & Fdy. |
| Western Railway of Alabama..... | 1 | Bed.-Roomette | 85 0 | Alum. | 1.. | 146,000 | August | Nov. '47 | Pullman-Standard |
| | 1 | Coach | 85 0 | Alum. | 52 | 124,300 | August | Sept. '47 | Budd |
| | 1* | Mail-Bag. | 85 0 | Alum. | 1.. | 119,200 | August | Nov. '47 | Pullman-Standard |

* Not air-conditioned. † Articulated triple units.

Locomotives Ordered and Built in 1946

By FRED C. MILES

Associate Editor

THE accompanying tables list a total of 1,545 locomotives, including 629 for export, ordered in this country last year, according to reports received by *Railway Age*. Of the 919 locomotives ordered for domestic use, 856 were Diesel-electric, 55 were steam and 8 were electric. The railroads of the United States ordered 48 steam, 802 Diesel-electric and 1 electric locomotives. Orders placed by private car lines and industrial companies called for 7 steam, 54 Diesel-electric and 8 electric loco-

Locomotives Built, 1929-1946

| Year | Domestic | U. S. Export | Total |
|-----------|----------|--------------|-------|
| 1946..... | 690 | 987 | 1,677 |
| 1945..... | 935 | 1,910 | 2,845 |
| 1944..... | 1,171 | 78 | 1,249 |
| 1943..... | 1,012 | 58 | 1,070 |
| 1942..... | 936 | 11 | 947 |
| 1941..... | 1,047 | 57 | 1,104 |
| 1940..... | 435 | 66 | 501 |
| 1939..... | 338 | 16 | 354 |
| 1938..... | 272 | 28 | 300 |
| 1937..... | 526 | 44 | 570 |
| 1936..... | 157 | 22 | 179 |
| 1935..... | 184 | 17 | 201 |
| 1934..... | 91 | 19 | 110 |
| 1933..... | 57 | 6 | 63 |
| 1932..... | 102 | 18 | 120 |
| 1931..... | 181 | 17 | 198 |
| 1930..... | 972 | 51 | 1,023 |
| 1929..... | 926 | 139 | 1,065 |

Note: Locomotives built for U. S. Government and for lend-lease excluded for years 1942-1944.

motives. Export orders, including United States Government purchases, comprised 460 steam and 169 Diesel-electric locomotives. (In addition to these totals, orders were reported by the American Locomotive Company for 20 660-hp., 46 1,000-hp. and 31 1,500-hp. Diesel-electric switching locomotives and 52 1,500-hp. Diesel-electric freight loco-

Locomotives Ordered, 1929-1946

| Year | Steam | Diesel | Electric | Total | U. S. Export |
|-----------|-------|--------|----------|-------|--------------|
| 1946..... | 55 | 856 | 8 | 919 | 629 |
| 1945..... | 148 | 691 | 6 | 845 | 1,895 |
| 1944..... | 74 | 680 | 3 | 757 | 134 |
| 1943..... | 413 | 635 | 0 | 1,048 | 60 |
| 1942..... | 363 | 894 | 12 | 1,269 | 32 |
| 1941..... | 302 | 1,104 | 38 | 1,444 | 85 |
| 1940..... | 207 | 492 | 13 | 712 | 85 |
| 1939..... | 119 | 249 | 32 | 400 | 40 |
| 1938..... | 36 | 160 | 29 | 225 | 24 |
| 1937..... | 173 | 145 | 36 | 354 | 56 |
| 1936..... | 435 | 77 | 24 | 536 | 22 |
| 1935..... | 30 | 60 | 7 | 97 | 15 |
| 1934..... | 72 | 37 | 76 | 185 | 17 |
| 1933..... | 17 | 25 | 0 | 42 | 7 |
| 1932..... | 5 | 7 | 0 | 12 | 1 |
| 1931..... | 62 | 21 | 91 | 174 | 28 |
| 1930..... | 382 | 18 | 21 | 421 | 20 |
| 1929..... | 1,055 | 80 | 95 | 1,230 | 106 |

Note: U. S. Government purchases excluded for years 1942-1944.

Domestic Diesel Locomotive Orders by Horsepower and Purchaser

| Horsepower | Railroads | | Private Car Lines and Others | | Total | |
|----------------|-----------|------|------------------------------|------|-------|------|
| | 1946 | 1945 | 1946 | 1945 | 1946 | 1945 |
| 8,000..... | 1 | 0 | 0 | 0 | 1 | 0 |
| 6,000..... | 101 | 53 | 0 | 1 | 101 | 54 |
| 5,400..... | 0 | 11 | 0 | 0 | 0 | 11 |
| 4,500..... | 81 | 10 | 0 | 0 | 81 | 10 |
| 4,050..... | 0 | 17 | 0 | 0 | 0 | 17 |
| 4,000..... | 9 | 16 | 0 | 1 | 9 | 17 |
| 3,000..... | 41 | 6 | 0 | 0 | 41 | 6 |
| 2,700..... | 0 | 9 | 0 | 0 | 0 | 9 |
| 2,000..... | 60 | 32 | 0 | 0 | 60 | 32 |
| 1,500..... | 227 | 63 | 0 | 1 | 227 | 64 |
| 1,350..... | 0 | 4 | 0 | 0 | 0 | 4 |
| 1,000..... | 221 | 297 | 3 | 14 | 224 | 311 |
| 660-600..... | 46 | 53 | 12 | 18 | 58 | 71 |
| Under 600..... | 15 | 24 | 39 | 61 | 54 | 85 |
| Total..... | 802 | 595 | 54 | 96 | 856 | 693 |

motives, the purchasers of which were not designated.)

Production for domestic use included 626 Diesel-electric, 1 electric and 61 steam locomotives. Locomotive production for export included 160 Diesel-electric and 827 steam locomotives.

The accompanying list of orders was compiled chiefly from reports received by *Railway Age* in answer to a request for data from railroads, private car lines, industrial companies and contract locomotive builders; and is believed to be reasonably complete.

Steam Locomotives Ordered in 1946

For Service in the United States

| Purchaser | No. | Type | Service | Weight | Tractive Force | Cylinders | Date of Order | Date of Delivery | Builder |
|--|-----|---------|---------|---------|----------------|------------------|---------------|------------------------|--------------|
| Aliquippa & Southern | 2 | 0-6-0 | Sw. | | 42,900 | | June | | American |
| Chesapeake & Ohio | 30 | 2-8-4 | Freight | 468,900 | 83,350* | 26 x 34 | June | Feb. to May '47 | American |
| | 10 | 2-8-4 | Freight | 468,900 | 83,350* | 26 x 34 | June | Dec. 46-Jan., Feb. '47 | Lima |
| Clinchfield | 4 | 4-6-6-4 | Freight | 607,000 | 101,120 | 22 x 32 (4 cyl.) | October | July '47 | American |
| Connecticut Coke | 1 | 0-4-0 | Sw. | 90,000 | 15,300 | 22 x 18 | July | July '47 | H. K. Porter |
| General American Transportation Corp. | 2 | 0-6-0 | Sw. | 126,000 | 25,865 | 18 x 24 | June | April '47 | H. K. Porter |
| Muron Milling | 1 | 0-4-0 | Sw. | 70,000 | 12,700 | 20 x 18 | June | June '47 | H. K. Porter |
| Interlake Iron Corp. | 1 | 0-4-0 | Sw. | 118,000 | 19,700 | 25 x 20 | March | Feb. '47 | H. K. Porter |
| Jones & Laughlin Steel Corp. | 2 | 0-4-0 | Sw. | 93,000 | 18,500 | 15 x 16 | August | April '47 | H. K. Porter |
| White Pass & Yukon | 2 | 2-8-2 | Freight | 142,000 | 25,200 | 17 x 22 | March | | Baldwin |

* With booster.

United States—Export

| Purchaser | No. | Type | Service | Weight | Force Tractive | Cylinders | Date of Order | Date of Delivery | Builder |
|---|-----|--------|--------------|---------|----------------|-------------------|---------------|------------------|--------------|
| H. A. Brassert Co. | 2 | 0-4-0 | Sw. | 72,000 | 15,000 | 14 x 18 | July | May '47 | H. K. Porter |
| | 1 | 0-6-0 | Sw. | 102,000 | 21,360 | 16 x 24 | July | May '47 | H. K. Porter |
| Companhia Usinas Sao Jao | 1 | 0-8-0 | Sw. | 38,000 | 8,238 | 10 x 14 | August | June '47 | H. K. Porter |
| Consejo Adm. de los Ferros Carril Nacionales (Colombia) | 6 | 4-8-2 | Freight | 179,000 | 30,500 | 18½ x 22 (2 cyl.) | June | | Baldwin |
| Consolidated Railways of Colombia | 15 | 2-8-2 | | | | | December | 1947 | H. K. Porter |
| Consejo de Ferros-Carriles | 15 | 4-8-2 | Frt. & Pass. | 190,500 | 32,000 | 18½ x 22 | November | June '47 | H. K. Porter |
| Equitable Equip. Co. | 1 | 2-8-10 | Freight | | 23,200 | | September | | American |

Export

529

895

134

60

32

85

40

24

56

22

15

17

7

28

20

106

raiser

1945

0

54

11

10

17

17

6

9

32

64

4

311

85

693

s was

ceived

request

lines,

loco-

to be

er

er

er

er

er

er

er

er

er

er

er

er

er

er

er

er

er

er

er

er

er

er

er

er

er

er

| Purchaser | No. | Type | Service | Weight | Tractive Force | Cylinders | Date of Order | Date of Delivery | Builder |
|---|-----|--------|------------|---------|----------------|------------------|---------------|------------------|--------------|
| Ferro Carril de Ambalema-Ibaque (Colombia) | 2 | 4-8-0 | Freight | 130,000 | 27,264 | 18 x 22 (2 cyl.) | February | .... | Baldwin |
| Ferro Carril de Antioquia (Colombia) | 6 | 2-8-2 | Pass.-Frt. | 138,000 | 26,400 | 17 x 22 (2 cyl.) | April | .... | Baldwin |
| Finnish State Rys. | 10 | 2-10-0 | Freight | 219,000 | 51,500 | 25 x 28 (2 cyl.) | June | Oct.-Nov. | Baldwin |
| Greece | 8 | 2-10-0 | Freight | 188,000 | 41,100 | 21 x 28 (2 cyl.) | August | .... | American |
| National Rys. of Mexico | 10 | 2-8-0 | Freight | 196,000 | 43,300 | 22 x 28 (2 cyl.) | June | Oct.-Nov. | Baldwin |
| Polish State Railways | 40 | 2-10-0 | Freight | 260,500 | 51,400 | 25 x 27 1/2 | December | 1947 | Baldwin |
| | 40 | 2-10-0 | Freight | 260,500 | 51,400 | 25 x 27 1/2 | December | 1947 | American |
| | 20 | 2-10-0 | Freight | 230,000 | 52,140 | 24 x 28 1/2 | December | 1947 | Lima |
| Soviet Union | 13 | 2-10-0 | Freight | .... | 51,500* | .... | May | .... | American |
| | 30 | 0-6-0 | Freight | .... | .... | .... | February | .... | Dav. Besler |
| Tecnica Industrial (Mexico) | 1 | 0-4-0 | Sw. | 48,000 | 9,200 | 17 x 16 | March | December | H. K. Porter |
| Turkish State Rys. | 62 | .... | .... | .... | .... | .... | December | .... | Vulcan |
| United Fruit Co. (Guatemala) | 6 | 2-8-2 | Freight | 145,500 | 27,625 | 18 x 22 (2 cyl.) | March | .... | Baldwin |
| U. S. Government (For China through U.N.R.R.A.) | 80 | 2-8-0 | Freight | 202,000 | 43,300 | 22 x 28 (2 cyl.) | February | .... | Baldwin |
| | 35 | 2-8-0 | Freight | 202,000 | 43,300 | 22 x 28 (2 cyl.) | February | .... | American |
| | 45 | 2-8-0 | Freight | 171,000 | 43,300 | 22 x 28 (2 cyl.) | April | .... | Lima |
| Usina Sierva Grande (Brazil) | 1 | 0-6-0 | Sw. | 62,000 | 12,925 | 13 x 18 | May | April '47 | H. K. Porter |

* Including booster.

Diesel, Electric, Gas-Mechanical and Other Internal-Combustion Locomotives Railroad Orders—For Service in the United States

| Purchaser | No. | Wheel Arrangement | Service | Type | Weight | Horse power | Date of Order | Date of Delivery | Builder Locomotive Builder Electrical Equipment Engine Builder |
|--|-----|-------------------|-------------|--------------|-----------|-------------|---------------|--------------------|--|
| Aberdeen & Rock Fish | 1 | B-B | Freight | Diesel-Elec. | 230,000 | 1,500 | September | .... | Electro-Motive |
| Alabama, Tennessee & Northern | 2 | B-B | Freight | Diesel-Elec. | 230,000 | 1,000 | October | .... | American-G.E. |
| Alton | 20 | B-B | Freight | Diesel-Elec. | 230,000 | 1,500 | February | December | Electro-Motive |
| Alton & Southern | 4 | B-B | Rd. & Sw. | Diesel-Elec. | 230,000 | 1,500 | August | April '47 | American-G.E. |
| Atchison, Topeka & Santa Fe | 1 | AIA-AIA | Passenger | Diesel-Elec. | 984,000 | 6,000 | April | Jan. '47 | Fairb'ks, Morse-G.E. |
| | 4 | AIA-AIA | Passenger | Diesel-Elec. | 800,000 | 6,000 | August | 1st qtr. '47 | American-G.E. |
| | 4 | .... | Sw. | Diesel-Elec. | 240,000 | 1,000 | September | March-Apr. '47 | American-G.E. |
| Atlantic & East Carolina | 1 | B-B | Sw. | Diesel-Elec. | 198,000 | 600 | September | Feb. '47 | Electro-Motive |
| Baltimore & Ohio | 3 | 4(B-B) | Passenger | Diesel-Elec. | 980,000 | 6,000 | February | March '47 | Electro-Motive |
| | 1 | 2(B-B) | Passenger | Diesel-Elec. | 490,000 | 3,000 | February | March '47 | Electro-Motive |
| Central of Pennsylvania | 5 | 3(B-B) | Freight | Diesel-Elec. | 690,000 | 4,500 | March | April '47 | Electro-Motive |
| Central of Georgia | 4 | B-B | Freight | Diesel-Elec. | 230,000 | 1,500 | July | .... | Electro-Motive |
| Chesapeake Western | 3 | B-B | Sw. | Diesel-Elec. | 198,500 | 660 | August | .... | Baldwin-West. |
| Chicago, Burlington & Quincy | 1 | 1B-1B | Passenger | Diesel-Elec. | 313,000 | 2,000 | October | 1947 | Electro-Motive |
| | 5 | 2(1B-1B) | Passenger | Diesel-Elec. | 626,000 | 4,000 | October | 1947 | Electro-Motive |
| | 3 | 3(B-B) | Passenger | Diesel-Elec. | 690,000 | 4,500 | October | 1947 | Electro-Motive |
| | 2 | 3(B-B) | Freight | Diesel-Elec. | 690,000 | 4,500 | October | 1947 | Electro-Motive |
| | 6 | 4(B-B) | Freight | Diesel-Elec. | 920,000 | 6,000 | October | 1947 | Electro-Motive |
| | 6 | 3(B-B) | Freight | Diesel-Elec. | 690,000 | 4,500 | January | .... | Electro-Motive |
| Chicago Great Western | 1 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,500 | November | Jan. '47 | American-G.E. |
| Chicago, Indianapolis & Louisville | 1 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | September | November | Fairb'ks, Morse-West. |
| Chicago, Milwaukee, St. Paul & Pacific | 5 | AIA-AIA | Passenger | Diesel-Elec. | 984,000 | 6,000 | April | Oct. 46-Mar. '47 | Fairb'ks, Morse-G.E. |
| | 18 | .... | Branch Line | Diesel-Elec. | .... | 1,500 | March | Nov. '46-Mar. '47 | American-G.E. |
| Chicago & North Western | 11 | AIA-AIA | Passenger | Diesel-Elec. | 350,000 | 1,000 | October | .... | Baldwin-West. |
| | 11 | .... | Passenger | Diesel-Elec. | 313,000 | 2,000 | August | .... | Electro-Motive |
| | 8 | 3(B-B) | Freight | Diesel-Elec. | 690,000 | 4,500 | August | .... | Electro-Motive |
| | 2 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | January | September | Fairb'ks, Morse-West. |
| | 2 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | January | October | Fairb'ks, Morse-West. |
| Chicago, St. Paul, Minneapolis & Omaha | 2 | AIA-AIA | Passenger | Diesel-Elec. | 328,000 | 4,000 | August | .... | Fairb'ks, Morse-G.E. |
| Columbus & Greenville | 5 | AIA-AIA | Rd.-Sw. | Diesel-Elec. | 300,000 | 1,500 | July | 4th qtr. '46 | Baldwin-West. |
| Copper Range | 2 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | November | Feb. '47 | Baldwin-West. |
| Delaware & Hudson | 7 | B-B | Rd.-Sw. | Diesel-Elec. | 229,200 | 1,500 | July | Nov.-Dec. '46-'47 | American-G.E. |
| Delaware, Lackawanna & Western | 2 | 3(B-B) | Passenger | Diesel-Elec. | 690,000 | 4,500 | January | December | Electro-Motive |
| | 2 | 3(B-B) | Freight | Diesel-Elec. | 690,000 | 4,500 | January | December | Electro-Motive |
| | 2 | 2(B-B) | Helper | Diesel-Elec. | 460,000 | 3,000 | January | December | Electro-Motive |
| Denver & Rio Grande Western | 2 | AIA | Passenger | Diesel-Elec. | 940,000 | 6,000 | July | Jan. '47 | American-G.E. |
| Detroit & Mackinac | 1 | .... | Sw. | Diesel-Elec. | .... | 660 | February | June | American-G.E. |
| | 3 | .... | Rd. Ser. | Diesel-Elec. | .... | 1,500 | February | October | American-G.E. |
| | 2 | .... | Rd. Ser. | Diesel-Elec. | .... | 1,500 | February | December | American-G.E. |
| Detroit Terminal | 1 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | July | December | Baldwin-West. |
| Duluth, South Shore & Atlantic | 5 | B-B | Rd.-Sw. | Diesel-Elec. | 243,500 | 1,000 | August | Dec.-Jan.-Feb. '47 | American-G.E. |
| Erie | 7 | 3(B-B) | Passenger | Diesel-Elec. | 690,000 | 4,500 | January | July '47 | Electro-Motive |
| | 3 | 4(B-B) | Freight | Diesel-Elec. | 920,000 | 6,000 | June | Sept. '47 | Electro-Motive |
| | 2 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | July | Nov.-Dec. | Baldwin-West. |
| | 9 | B-B | Sw. | Diesel-Elec. | 230,000 | 1,000 | July | Oct.-Dec. | American-G.E. |
| | 2 | B-B | Sw. | Diesel-Elec. | 198,000 | 660 | July | November | Baldwin-West. |
| | 6 | B-B | Sw. | Diesel-Elec. | 199,000 | 660 | July | Oct.-Jan. '47 | American-G.E. |
| | 1 | B-B | Sw. | Diesel-Elec. | 88,000 | 380 | July | October | General Electric |
| Escanaba & Lake Superior | 1 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | January | May | Baldwin-West. |
| Florida East Coast | 5 | 1B-1B | Passenger | Diesel-Elec. | 300,000 | 2,000 | September | .... | Electro-Motive |
| Great Northern | 2 | 2(B-B) | Passenger | Diesel-Elec. | 485,000 | 3,000 | June | July '47 | Electro-Motive |
| | 4 | B-B | Passenger | Diesel-Elec. | 242,500 | 1,500 | June | July '47 | Electro-Motive |
| | 3 | 1B-1B | Passenger | Diesel-Elec. | 214,890 | 2,000 | June | July '47 | Electro-Motive |
| | 3 | 2(B-B) | Freight | Diesel-Elec. | 485,000 | 3,000 | June | July '47 | Electro-Motive |
| | 8 | B-B | Sw. | Diesel-Elec. | 242,500 | 1,500 | June | July '47 | Electro-Motive |
| Gulf Coast Lines | 6 | 2(B-B) | Freight | Diesel-Elec. | 460,000 | 3,000 | June | Aug. '47 | Electro-Motive |
| Gulf, Mobile & Ohio | 55 | B-B | Freight | Diesel-Elec. | 230,000 | 1,500 | March | 1946-'47 | American-G.E. |
| | 25 | B-B | Freight | Diesel-Elec. | 220,000 | 1,500 | March | 1946-'47 | American-G.E. |
| | 5 | B-B | Sw. | Diesel-Elec. | 230,000 | 1,000 | July | Oct.-Dec. | American-G.E. |
| | 5 | B-B | Rd.-Sw. | Diesel-Elec. | 240,000 | 1,000 | July | Jan.-Mar. '47 | American-G.E. |
| | 1 | B-B | Rd.-Sw. | Diesel-Elec. | 240,000 | 1,500 | August | August | Ingalls Shipbuilding-West. Nat'l Supply |
| Houston Belt & Terminal | 2 | B-B | Sw. | Diesel-Elec. | 230,000 | 1,000 | July | Oct.-Nov. | American-G.E. |
| International-Great Northern | 2 | 3(B-B) | Freight | Diesel-Elec. | 690,000 | 4,500 | June | Aug. '47 | Electro-Motive |
| | 1 | 1B-1B | Passenger | Diesel-Elec. | 313,000 | 2,000 | November | Oct. '47 | Electro-Motive |
| Kansas City Public Service | 1 | B-B | Freight | Electric | 130,000 | 656 | November | Dec. '47 | General Electric |
| Kansas City Southern | 4* | B-B | Sw. | Diesel-Elec. | 248,000 | 1,000 | Dec. '45 | November | Electric-Motive |
| | 1 | B-B | Sw. | Diesel-Elec. | 198,500 | 660 | January | April | Baldwin-West. |
| | 1 | AIA-AIA | Freight | Diesel-Elec. | 1,256,000 | 8,000 | July | November | Fairb'ks, Morse-G.E. |
| | 8 | B-B | Sw. | Diesel-Elec. | 248,000 | 1,000 | September | December | Electro-Motive |
| | 5 | 4(B-B) | Freight | Diesel-Elec. | 920,000 | 6,000 | September | 1st qtr. '47 | Electro-Motive |
| | 2 | 2(B-B) | Passenger | Diesel-Elec. | 460,000 | 3,000 | September | 3rd qtr. '47 | Electro-Motive |
| | 1 | AIA-AIA | Freight | Diesel-Elec. | 314,000 | 2,000 | October | Jan. '47 | Fairb'ks, Morse-G.E. |
| | 1 | AIA-AIA | Passenger | Diesel-Elec. | 328,000 | 4,000 | November | .... | Fairb'ks, Morse-West. |
| Lake Terminal | 8 | B-B | Sw. | Diesel-Elec. | 250,000 | 1,000 | November | March '47 | Electro-Motive |
| Lancaster & Chester | 1 | B-B | Sw. | Diesel-Elec. | 248,000 | 1,000 | February | .... | Electro-Motive |

| Purchaser | No. | Wheel- Arrangement | Service | Type | Weight | Horse power | Date of Order | Date of Delivery | Builder Locomotive Builder Electrical Equipment Engine Builder |
|---|-----|-----------------------|------------|--------------|-----------|----------------|------------------|---------------------|---|
| La Salle & Bureau County | 1 | B-B | Sw. | Diesel-Elec. | 198,500 | 660 | January | January | Baldwin-West |
| Long Island | 5* | B-B | Sw. | Diesel-Elec. | 198,000 | 600 | Dec. '45 | June | American-G.E. |
| Maine Central | 2 | 2(B-B) | Freight | Diesel-Elec. | 460,000 | 3,000 | July | July '47 | Electro-Motive |
| Manufacturers Junction | 1 | B-B | Sw. | Diesel-Elec. | 198,000 | 600 | August | ..... | Electro-Motive |
| Maryland & Pennsylvania | 2 | B-B | Sw. | Diesel-Elec. | 248,000 | 1,000 | March | ..... | Electro-Motive |
| Minneapolis & St. Louis | 1 | B-B | Sw. | Diesel-Elec. | 198,000 | 600 | March | ..... | Electro-Motive |
| Minneapolis, St. Paul & Sault Ste. Marie | 6 | B-B | Rd.-Sw. | Diesel-Elec. | 243,000 | 1,000 | March | May-Oct. | American-G.E. |
| Minnesota Transfer | 1 | B-B | Rd.-Sw. | Diesel-Elec. | 243,000 | 1,000 | November | May '47 | American-G.E. |
| Minnesota Western | 3 | B-B | Sw. | Diesel-Elec. | 231,000 | 1,000 | July | Oct.-Nov. | American-G.E. |
| Missouri-Kansas-Texas | 2 | B-B | Sw. | Diesel-Elec. | 198,200 | 660 | August | October | American-G.E.- Mac- |
| | 2 | B-B | Sw. | Diesel-Elec. | 220,350 | 1,000 | August | November | Intosh Seymore |
| | 1 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | May | September | American-G.E.- Mac- |
| | 6 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | May | September | Intosh Seymore |
| | 21 | B-B | Freight | Diesel-Elec. | 230,000 | 1,500 | June | April-May '47 | Fairb'ks, Morse-West. |
| | 5 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | September | Jan. '47 | Electro-Motive |
| | 6 | 3(B-B) | Freight | Diesel-Elec. | 240,000 | 1,000 | September | Jan. '47 | Electro-Motive |
| | 6 | 2(B-B) | Freight | Diesel-Elec. | 690,000 | 4,500 | April | April '47 | Baldwin-West. |
| | 2 | 3(B-B) | Freight | Diesel-Elec. | 460,000 | 3,000 | June | ..... | Electro-Motive |
| | 1 | B-B | Sw. | Diesel-Elec. | 690,000 | 4,500 | June | ..... | Electro-Motive |
| | 20 | AIA-AIA | Passenger | Diesel-Elec. | 137,600 | 600 | May | December | G.E.-Cooper-Bessemer |
| | 28 | B-B | Freight | Diesel-Elec. | 324,000 | 2,000 | February | April '47 | Electro-Motive |
| | 6 | B-B | Pass.-Frt. | Diesel-Elec. | 230,000 | 1,500 | February | April-May '47 | Electro-Motive |
| | 6 | 3(AIA-AIA) | Pass.-Frt. | Diesel-Elec. | 300,000 | 4,500 | February | April '47 | Electro-Motive |
| | 6 | B-B | Freight | Diesel-Elec. | 232,000 | 1,500 | March | Jan.-Feb. '47 | Baldwin-West |
| | | | | | | | | | American-G.E. |
| New York, New Haven & Hart- ford | 15 | B-B | Freight | Diesel-Elec. | 690,000 | 4,500 | October | March '47 | American-G.E. |
| New Orleans Public Belt | 3 | B-B | Sw. | Diesel-Elec. | 198,500 | 660 | April | Oct.-Nov. | Baldwin-West. |
| Northeast Oklahoma | 1* | R-R | Sw. | Diesel-Elec. | 230,000 | 1,000 | Dec. '45 | May | American-G.E. |
| Northern Pacific | 1* | B-B | Sw. | Diesel-Elec. | 88,000 | 380 | Dec. '45 | July | G.E.-Caterpill'r |
| | 5 | 4(B-B) | Freight | Diesel-Elec. | 920,000 | 6,000 | April | December | Electro-Motive |
| | 6 | 3(B-B) | Passenger | Diesel-Elec. | 690,000 | 4,500 | April | December | Electro-Motive |
| | 2 | B-B | Sw. | Diesel-Elec. | 198,500 | 660 | October | December | Baldwin-West. |
| | 2 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | October | December | Baldwin-West. |
| | 4 | B-B | Sw. | Diesel-Elec. | 198,500 | 660 | February | Oct.-Nov. | Baldwin-West. |
| | 5* | B-B | Sw. | Diesel-Elec. | 194,000 | 600 | Dec. '45 | June | Electro-Motive |
| | 11 | 2(2-D+D-2) | Passenger | Diesel-Elec. | 1,200,000 | 6,000 | February | March '47 | Baldwin-West. |
| | 3 | B-B | Sw. | Diesel-Elec. | 1,200,000 | 6,000 | October | Aug. '47 | Baldwin-West. |
| | 2 | B-B | Freight | Diesel-Elec. | 198,000 | 600 | November | March '47 | American-G.E. |
| | 6 | AIA-AIA | Passenger | Diesel-Elec. | 1,150,000 | 7,500 | December | ..... | Electro-Motive |
| | 6 | B-B | Sw. | Diesel-Elec. | 313,000 | 2,000 | September | June '47 | Electro-Motive |
| | 2** | B-B | Sw. | Diesel-Elec. | 210,000 | 1,500 | September | Sept. '47 | Electro-Motive |
| | 2** | B-B | Rd.-Sw. | Diesel-Elec. | 137,600 | 600 | September | December | General Electric |
| | 1 | B-B | Sw. | Diesel-Elec. | 215,000 | 1,000 | February | ..... | Electro-Motive |
| | 1 | B-B | Sw. | Diesel-Elec. | 88,000 | 380 | August | December | G.E.-Caterpill'r |
| | 2 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | October | December | Fairb'ks, Morse-West. |
| | 4 | B-B | Sw. | Diesel-Elec. | 230,000 | 1,000 | April | Aug.-Sept. | American-G.E. |
| | 5 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | April | June-July-Aug. | Baldwin-West. |
| | | | | | | | | | Electro-Motive |
| Richmond, Fredericksburg & Potomac | 4 | B-B | Sw. | Diesel-Elec. | 230,000 | 1,000 | March | August | American-G.E. |
| Sacramento Northern | 5 | B-B | Sw. | Diesel-Elec. | 88,000 | 380 | October | December | General Electric |
| St. Joseph Belt | 1 | B-B | Sw. | Diesel-Elec. | 198,000 | 600 | February | July | Electro-Motive |
| St. Louis & O'Fallon | 1 | B-B | Sw. | Diesel-Elec. | 199,000 | 660 | February | May | American-G.E. |
| St. Louis-San Francisco | 2 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | February | 1946 | Baldwin-West. |
| | 6 | AIA-AIA | Passenger | Diesel-Elec. | 315,000 | 2,000 | April | 1947 | Electro-Motive |
| | 8 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | April | 1947 | Baldwin-West. |
| | 7 | B-B | Sw. | Diesel-Elec. | 230,000 | 1,000 | April | 1947 | American-G.E. |
| | 1 | AIA-AIA | Passenger | Diesel-Elec. | 317,333 | 2,000 | June | September | Electro-Motive |
| | 1 | 2-D+D-2 | Freight | Diesel-Elec. | 577,200 | 3,000 | July | July | Baldwin-West. |
| | 13 | 2-D+D-2 | Freight | Diesel-Elec. | 577,200 | 3,000 | July | 1947 | Baldwin-West. |
| | 3 | AIA-AIA | Passenger | Diesel-Elec. | 300,000 | 1,500 | September | 1947 | Baldwin-West. |
| | 1 | B-B | Sw. | Diesel-Elec. | 241,000 | 1,000 | September | December | Electro-Motive |
| | 1 | B-B | Sw. | Diesel-Elec. | 241,000 | 1,000 | October | December | Electro-Motive |
| | 6 | B-B | Sw. | Diesel-Elec. | 198,000 | 600 | November | March '47 | Electro-Motive |
| | 15 | B-B | Sw. | Diesel-Elec. | 248,000 | 1,000 | November | April '47 | Electro-Motive |
| | 4 | 2(B-B) | Transfer | Diesel-Elec. | 486,000 | 2,000 | November | April '47 | Electro-Motive |
| | 5 | 3(AIA-AIA) | Passenger | Diesel-Elec. | 925,000 | 6,000 | May | Feb.-June '47 | Electro-Motive |
| | 20 | 4(B-B) | Freight | Diesel-Elec. | 920,000 | 6,000 | October | April-Oct. '47 | Electro-Motive |
| | 23 | B-B | Sw. | Diesel-Elec. | 1,000 | 1,000 | December | ..... | American-G.E. |
| | 1 | B-B | Passenger | Diesel-Elec. | 480,000 | 3,000 | October | March '47 | Electro-Motive |
| | 3 | B-B | Sw. | Diesel-Elec. | 140,000 | 650 | March | ..... | Whit.-West. Buda |
| | 4 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | May | June | Baldwin-West. |
| | 7 | B-B | Sw. | Diesel-Elec. | 248,000 | 1,000 | October | Jan. '47 | Electro-Motive |
| | 2 | B-B | Sw. | Diesel-Elec. | 230,000 | 1,000 | May | Aug.-Sept. | American-G.E. |
| | 5 | 3(B-B) | Passenger | Diesel-Elec. | 690,000 | 4,500 | August | ..... | Electro-Motive |
| | 18 | 4(B-B) | Freight | Diesel-Elec. | 920,000 | 6,000 | October | ..... | Electro-Motive |
| | 25 | B-B | Sw. | Diesel-Elec. | 248,000 | 1,000 | October | ..... | Electro-Motive |
| | 2 | B-B | Sw. | Diesel-Elec. | ..... | 6,000 | December | May '47 | American-G.E. |
| | 10 | B-B | Freight | Diesel-Elec. | ..... | 6,000 | December | April '47 | American-G.E. |
| | 4 | B-B | Sw. | Diesel-Elec. | ..... | 1,000 | December | ..... | Fairb'ks, Morse |
| | 1 | B-B | Sw. | Diesel-Elec. | 198,000 | 600 | November | April '47 | Electro-Motive |
| | 2 | B-B | Sw. | Diesel-Elec. | 238,000 | 1,000 | March | July | American-G.E. |
| | 1 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | March | May | Baldwin-West. |
| | 1 | B-B | Sw. | Diesel-Elec. | 248,000 | 1,000 | March | December | Baldwin-West. |
| | 1 | B-B | Passenger | Diesel-Elec. | 315,000 | 4,000 | March | March '47 | Electro-Motive |
| | 2 | B-B | Sw. | Diesel-Elec. | 248,000 | 1,000 | October | November | Fairb'ks, Morse-West. |
| | 2 | B-B | Sw. | Diesel-Elec. | 200,000 | 660 | October | Feb. '47 | American-G.E. |
| | 2 | B-B | Sw. | Diesel-Elec. | 200,000 | 660 | October | Feb. '47 | Baldwin-West. |
| | 1 | B-B | Sw. | Diesel-Elec. | 200,000 | 660 | October | March '47 | Electro-Motive |
| | 1 | B-B | Sw. | Diesel-Elec. | 248,000 | 1,000 | March | ..... | Electro-Motive |
| | 1 | B-B | Sw. | Diesel-Elec. | 198,000 | 600 | December | ..... | Electro-Motive |
| | 2 | B-B | Sw. | Diesel-Elec. | 248,000 | 1,000 | April | ..... | Electro-Motive |
| | 2 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | July | ..... | Baldwin-West. |
| | 1 | B-B | Rd.-Sw. | Diesel-Elec. | 240,000 | 1,500 | July | ..... | Baldwin-West. |
| | 3 | 3(B-B) | Passenger | Diesel-Elec. | 690,000 | 4,500 | 1946 | ..... | Electro-Motive |

*Not listed last year.
**In conjunction with the Pennsylvania and the Wabash.

Private Car Lines and Other Orders—For Service in the United States

| Purchaser | No. | Wheel Arrangement | Service | Type | Weight | Horse- power | Date of Order | Date of Delivery | Builder Locomotive Builder Electrical Equipment Engine Builder |
|---------------------------|-----|----------------------|---------|--------------|---------|-----------------|------------------|---------------------|---|
| American Cyanamid Co. | 1 | B-B | Sw. | Diesel-Elec. | 198,500 | 660 | February | May | Baldwin-West. |
| American Steel & Wire Co. | 2 | B-B | Sw. | Diesel-Elec. | 100,000 | 380 | July | Aug. '47 | Porter-West.-Cater. |
| Barber Asphalt Co. | 2 | B-B | Sw. | Diesel-Elec. | 130,000 | 380 | May | April '47 | Porter-West.-Cater. |

| Purchaser | No. | Wheel Arrangement | Service | Type | Weight | Horse- power | Date of Order | Date of Delivery | Builder Locomotive Builder Electrical Equipment Engine Builder |
|--|-----|----------------------|-----------|--------------|---------|-----------------|------------------|---------------------|---|
| Bethlehem Steel Corp. | 1 | ..... | Sw. | Diesel-Elec. | 100,000 | 300 | February | ..... | Whit.-West.-Cummins |
| ..... | 1 | ..... | Sw. | Diesel-Elec. | 50,000 | 150 | August | ..... | Whit.-West.-Cummins |
| Carnegie Illinois Steel Corp. .. | 1 | B-B | Sw. | Diesel-Elec. | 50,000 | 150 | September | ..... | Whit.-West.-Cummins |
| ..... | 1 | B | Sw. | Elec. | 200,000 | 180 | May | April '47 | H. K. Porter-West. |
| Chicago District Electric Gen- erating Corp. | 1 | B-B | Sw. | Diesel-Elec. | 50,000 | 150 | July | June '47 | Porter-West.-Cummins |
| Dayton Power & Light Co. | 1 | ..... | Sw. | Diesel-Elec. | 198,000 | 600 | July | ..... | Electro-Motive |
| Ford Motor Co. | 4 | ..... | Sw. | Diesel-Elec. | 140,000 | 566 | December | ..... | Whit.-West.-Buda |
| H. C. Frick Co. | 1 | ..... | Sw. | Diesel-Elec. | 198,000 | 660 | September | 4th qtr. | American-G.E. |
| Garden City Co. | 1 | B | Sw. | Gas-Mech. | 16,000 | 69 | October | June '47 | Porter-Buda |
| General Motors Corp. (Electro-Motive Division) .. | 1 | ..... | Sw. | Diesel-Elec. | 100,000 | 190 | April | ..... | Whit.-West.-Hercules |
| W. F. Hall Printing Co. | 1* | 2(AIA-AIA) | Passenger | Diesel-Elec. | 313,000 | 2,000 | February | ..... | Electro-Motive |
| Hamill Coal Co. | 1 | B | Sw. | Diesel-Elec. | 100,000 | 300 | Nov. '45 | September | Whit.-West.-Cummins |
| Theo. Hamm Brewing Co. | 1 | ..... | Sw. | Diesel-Mech. | 32,000 | 100 | January | January | Porter-Buda |
| S. A. Healy & Co. | 4 | ..... | Sw. | Diesel-Elec. | 50,000 | 190 | March | ..... | Whit.-West.-Hercules |
| Hercules Powder Co. | 1 | ..... | Sw. | Diesel-Elec. | 130,000 | 400 | July | ..... | Whit.-West.-Cummins |
| International Minerals & Chemical Co. | 2 | ..... | Sw. | Diesel-Elec. | 100,000 | 300 | February | ..... | Whit.-West.-Cummins |
| ..... | 3 | ..... | Sw. | Diesel-Elec. | 70,000 | 190 | April | ..... | Whit.-West.-Cater. |
| Lone Star Cement Corp. | 1 | ..... | Sw. | Diesel-Elec. | 130,000 | 380 | April | ..... | Whit.-West.-Cater. |
| ..... | 3 | B | Sw. | Diesel-Elec. | 70,000 | 240 | January | ..... | Whit.-West.-Hercules |
| Mathieson Alkali Works | 1 | B-B | Sw. | Diesel-Mech. | 24,000 | 95 | September | July '47 | Porter-Cater. |
| Missouri Portland Cement Co.. | 1 | ..... | Sw. | Diesel-Elec. | 198,000 | 600 | July | ..... | Electro-Motive |
| National Biscuit Co. | 1 | ..... | Sw. | Diesel-Elec. | 160,000 | 650 | June | ..... | Whit.-West.-Buda |
| National Supply Co. | 1 | B | Sw. | Diesel-Elec. | 50,000 | 190 | April | ..... | Whit.-West.-Hercules |
| National Tube Co. | 1 | B-B | Sw. | Diesel-Elec. | 50,000 | 150 | November | June '47 | Porter-West.-Cummins |
| ..... | 2 | B | Sw. | Diesel-Elec. | 130,000 | 400 | February | December | Porter-West.-Cummins |
| Peoples Gas, Light & Coke Co. | 1 | B-B | Sw. | Diesel-Elec. | 100,000 | 300 | September | June '47 | Porter-West.-Cummins |
| Phelps Dodge Corp. | 7 | B-B | Sw. | Diesel-Elec. | 130,000 | 400 | August | Jan. '47 | Porter-West.-Cummins |
| ..... | 2 | B-B | Sw. | Elec. | 250,000 | 840 | January | ..... | Baldwin-West. |
| ..... | 7 | B-B | Sw. | Diesel-Elec. | 248,000 | 1,000 | December | ..... | Electro-Motive |
| Pittsburgh Steel Co. | 1 | B | Sw. | Diesel-Elec. | 65,000 | 200 | August | June '47 | Porter-West.-Cummins |
| Potalash Forests, Inc. | 3 | ..... | Sw. | Diesel-Flec. | 140,000 | 650 | May | ..... | Whit.-West.-Sterling |
| Pure Oil Co. | 1 | ..... | Sw. | Diesel-Elec. | 100,000 | 300 | April | ..... | Whit.-West.-Cummins |
| Shell Oil Co. | 1 | ..... | Sw. | Diesel-Elec. | 90,000 | 300 | July | ..... | Whit.-West.-Cummins |
| Tennessee Eastman Corp. | 1 | B-B | Sw. | Diesel-Elec. | 240,000 | 1,000 | February | May | Baldwin-West. |
| Union Tank Car Co. | 1 | ..... | Sw. | Diesel-Elec. | 100,000 | 300 | February | ..... | Whit.-West.-Cummins |
| ..... | 1 | ..... | Sw. | Diesel-Elec. | 90,000 | 300 | February | ..... | Whit.-West.-Cummins |
| U. S. Gypsum Co. | 1 | C-C | Sw. | Diesel-Elec. | 150,000 | 660 | January | March '47 | Porter-West.-Cooper |
| Youngstown Sheet & Tube Co.. | 2 | ..... | Sw. | Diesel-Elec. | 100,000 | 300 | August | ..... | Whit.-West.-Cummins |

* Not listed last year.

-Export

| Purchaser | No. | Wheel Arrangement | Service | Type | Weight | Horse- power | Date of Order | Date of Delivery | Builder Locomotive Builder Electrical Equipment Engine Builder |
|---|-----|----------------------|-----------|--------------|---------|-----------------|------------------|---------------------|---|
| Admin. de Mexico, Alcohol ... | 1 | B-B | Sw. | Diesel-Elec. | 100,000 | 300 | April | April '47 | Porter-West.-Cummins |
| Canadian National | 10 | B-B | Sw. | Diesel-Elec. | 250,000 | 1,000 | January | November | Electro-Motive |
| Compania Cimento Portland Itau | 2 | B | Sw. | Diesel-Elec. | 50,000 | 150 | June | June '47 | Porter-West.-Cummins |
| Compania Melhoramentos de Sao-Braz | 2 | B | Sw. | Diesel-Mech. | 24,000 | 100 | January | Apr. '47 | Porter-Buda |
| Crows Nest Pass Coal Co. (Canada) | 1 | B-B | Sw. | Diesel-Elec. | 198,500 | 660 | June | ..... | Baldwin-West. |
| Eternit Colombia | 1 | B | Sw. | Diesel-Elec. | 16,000 | 68 | September | July '47 | Porter-Hercules |
| France | 70 | ..... | Sw. | Diesel-Elec. | 242,000 | 660 | January | 1946-47 | Baldwin-West. |
| ..... | 4 | ..... | Rd.-Sw. | Diesel-Elec. | 276,000 | 1,500 | January | ..... | Baldwin-West. |
| ..... | 22 | ..... | Passenger | Diesel-Elec. | 288,000 | 1,500 | July-Aug. | ..... | Baldwin-West. |
| ..... | 2 | ..... | Rd.-Sw. | Diesel-Elec. | 276,000 | 1,500 | July | ..... | Baldwin-West. |
| ..... | 1 | ..... | Sw. | Diesel-Elec. | 160,000 | 650 | November | ..... | Whit.-West.-Buda |
| Import-Export Industries | 1* | ..... | Sw. | Diesel-Elec. | 50,000 | 150 | Dec. '45 | ..... | Whit.-West.-Cummins |
| Iron Mines Co. of Venezuela .. | 3 | B-B | Rd.-Sw. | Diesel-Elec. | 260,000 | 1,500 | March | ..... | Baldwin-West. |
| Maritrop Trading Corp. | 6 | ..... | Sw. | Diesel-Elec. | 100,000 | 420 | October | ..... | Whit.-West.-Cooper |
| Ministry of Public Works & Transport (Brazil) | 30 | ..... | Sw. | Diesel-Elec. | 132,000 | 650 | August | ..... | Whit.-West.-Sterling |
| Ontario Northland | 3 | ..... | Sw. | Diesel-Elec. | 230,000 | 1,000 | February | June | American-G.E. |
| Sorocabana Ry. (Brazil) | 30* | ..... | Sw. | Diesel-Elec. | 190,000 | 1,300 | Dec. '45 | ..... | Whit.-West.-Sterling |
| United States (Treasury Dept.) | 12 | B | Mine | Diesel-Mech. | 14,000 | 65 | April | Feb. '47 | Porter-Electro-Motive |

*Not listed last year.

* * *



GENERAL NEWS

Johnson Cites Need for Additional Steel

Forecasts production lag in all industries unless freight car allocations are increased

Colonel J. Monroe Johnson, director of the Office of Defense Transportation, this week called upon other steel-consuming industries to "slow down" their production schedules in order that more steel can be allocated to the construction of freight cars. Declaring that there is at present a "record shortage" of box cars and that the situation will be "worse 12 months from now," the O. D. T. director predicted that unless more steel is diverted to the manufacture of freight cars, "production in the United States will be retarded by the want of transportation."

Addressing a December 30 press conference at Washington, D. C., Colonel Johnson said that there is no "dependable solution" to the current shortage, which, he remarked, is the "greatest since 1922." He added that approximately 16,000 to 18,000 freight cars were built monthly in 1922, when a comparable shortage existed, as compared to an estimated 6,719 monthly in 1941, 5,238 monthly in 1942, 4,000 monthly in 1944, 5,000 monthly in 1945, and 2,800 in December, 1946, the latter figure being little more than one-half of those turned out in August, 1946. He said that 3,259 cars are promised for delivery in January, 2,834 in February, and 3,662 in March.

Colonel Johnson said that efforts to secure adequate steel allocations for car builders through Civilian Production Administration channels were not successful, and that a plan whereby the Reconstruction Finance Corporation would finance the manufacture of 50,000 box cars was abandoned. With respect to the latter program, Colonel Johnson noted that the R. F. C. did not favor the plan, but he had "no idea" who recommended its abandonment.

Down the List—The O. D. T. director also said that railroads ranked sixth with respect to the distribution of steel to consuming industries during the first six months of 1946. He asserted that a majority of the steel has gone to jobbers, dealers and distributors, followed by the automotive, container, construction and steel converting and processing industries, respectively.

Referring to the possible conversion of surplus troop sleepers and kitchen cars into box cars, Colonel Johnson said that the R. F. C. has estimated that it would cost approximately \$5,000 to convert each car, many of which, he added, are being

sent to Alaska. At the same time, he noted that it costs approximately \$3,800 to construct a new car.

Turning to the export grain situation, Colonel Johnson said that as of December 25, 27,447 carloads—or approximately 96 per cent of the November-December program—had been put in "export position," and that "at the rate grain was arriving, the deadline of December 31 would find in addition to the program sufficient bulk grain to load approximately 15 ships of the January program." He said that grain was moving to the ports at an average of 4,000 cars per day.

Harvest Coming Up—At the same time, however, he predicted "great difficulty" in moving grain in the early months of 1947 and next spring, during which period he said the grain for export relief will "overlap" the new harvest. "The box cars now available, coupled with those to be delivered, will not be sufficient to serve nutrition needs," he continued. "There is very little that can be done today to add box cars to the railroads by next May when the wheat movement is the heaviest."

Again calling attention to the fact that weekly carloadings are the highest since 1930, when 400,000 additional cars were available, Colonel Johnson said that the railroads "never have done as much with so little which gets littler every day." He said that the railroads moved approximately 85 per cent of the "potential" in 1946, an achievement which, he predicted, would not be equalled in 1947.

Air Association Executive to Address D. C. Traffic Club

Robert Ramspeck, executive vice-president of the Air Transport Association and former congressman from Georgia, will be the speaker at the annual dinner meeting of the Traffic Club of Washington, D. C., which will be held at the Mayflower Hotel in that city on February 12, 1947.

New Haven to Seek Increase in Passenger Fares

Pointing out that the New York, New Haven & Hartford would benefit less than most railroads from the general freight rate increase effective January 1, because a relatively large portion of its revenues (around 40 per cent) is derived from passenger service, President H. S. Palmer has indicated that that road probably will ask the Interstate Commerce Commission to authorize an increase in its passenger fares. The war-time 10 per cent increase in fares was made permanent when the commission's order in the Ex Part 162 proceedings was issued in December, but the New Haven's special situation makes a further advance necessary, it was explained. The amount of the proposed increase was not disclosed.

Small Makes Final Report to President

Sees need for 100,000 freight cars to meet expanded rail requirements

The manufacture of railroad passenger cars during 1946 more than doubled the 1941 rate, but the output of freight cars, of which "an estimated 100,000 . . . are needed to meet expanded transportation requirements," remained "about one-third" short of the pre-war level, thereby resulting in a back-log of orders that would take "two years to fill at the October rate" of production, according to former Civilian Production Administrator John D. Small's final report to President Truman.

The report, entitled, "From War to Peace; Civilian Production Achievements in Transition," predicted that the effects of C. P. A. assistance to car builders by "informally" requesting steel companies to provide increased steel and by formal "directives" for increased steel for high pressure tank cars is not expected to "show up" until "the early part of 1947."

Reviewing reconversion problems, the report noted that freight cars and other rolling equipment did not receive proper maintenance and replacement during the war because of the shortage of materials and labor and that the production of freight cars during the war years was approximately 50 per cent of the 1941 rate.

"The August, 1945, production rate was also at this level, but output declined during the balance of the year," the report continued. "This drop was attributed largely to the lack of orders from the railroads which were slow in placing new orders because of declining profits and uncertainty over higher rates. Most companies purchase new rolling stock out of current earnings or float loans on which a favorable interest rate depends upon a good current earnings position."

Orders Mounted in 1946—According to the report, orders began to mount on the books of the railroad car manufacturers early in 1946 "despite the lack of a new rate decision," but strikes in the steel and coal industries prevented any rapid increases in production. It said that by the second quarter of 1946, it "became apparent" that a critical car shortage would occur during the third and fourth quarters.

"Car manufacturers were unable to obtain sufficient materials to increase production to alleviate the car shortage," the report observed. "In the third quarter of 1946, C. P. A. informally requested the steel industry to provide increased steel to

(Continued on page 119)

Answers Ship Group's Charge Against Roads

A.A.R. President Fletcher gives Lea "certain facts" about the rate situation

R. V. Fletcher, president of the Association of American Railroads, has written to Chairman Lea of the House committee on interstate and foreign commerce a letter in reply to the recent statement wherein the National Federation of American Shipping complained against water-competitive rail rates, charging the railroads with "taking advantage of the difficulties of the water lines to drive them out of business." As noted in the *Railway Age* of December 21, page 1054, the federation's statement went to the committee's subcommittee on transportation, which is engaged in the "national transportation inquiry" launched a year ago.

While he suggested that now was probably not the time to present the details of the situation to the committee, Judge Fletcher nevertheless went on to point up "certain facts about the situation which should not go unnoticed." Among other things, he stated that there is now outstanding a minimum-rate order for the intercoastal water services, which indicates that competition among the shipping lines themselves is a more potent force than railroad rates in holding water rates to the levels complained of. Judge Fletcher's letter follows in part:

"Rail rates on intercoastal traffic have long been made in relation to the water rates, and in all cases are higher than those made by the steamships. Since the close of the war, the railroads have engaged in a strenuous effort to secure general freight rate increases to meet increased costs. Such increases have now been authorized by the commission, not only for the railroads but also for the water lines, and are being put into effect by the railroads on January 1, 1947, the earliest date possible under the commission's order. The water lines are making corresponding increases in their rates effective the same day, as they are authorized to do by the Interstate Commerce Commission, without any necessity for legislative action.

Other Considerations—"Many factors other than water line competition must be considered in a general advance of railroad rates such as that which has just been authorized by the Interstate Commerce Commission. Chief among them are such important commercial considerations as preserving competing relationships between producing areas and major markets. For example, the 20 per cent increase authorized on rates on citrus fruits was limited to a maximum increase of 13 cents per 100 lbs. (the carriers' proposal was for a 25 per cent increase subject to a maximum of 15 cents). This was done to preserve competitive relationships between producers on the Pacific coast and those in Texas and Florida on fruit moving to the major consuming markets which are in and east of Chicago.

"Similar action was taken in connection

with lumber, on which the commission authorized an increase of 20 per cent subject to a maximum of 10 cents per 100 lbs. This latter maximum, which was the same as that proposed by the railroads, was fixed in order that the Pacific coast lumber producers might maintain competitive relationships in the major markets, Chicago and east, with lumber producers of the South and the Southwest. Panama canal competition had nothing to do with determining the maximum rate proposed.

Maritime Commission's View—"Another example of the effect of commercial competition in determining rate adjustments is to be noted in the iron and steel rates, as to which particular complaint is made in the statement filed by the National Federation of American Shipping. In this case, the adjustment proposed by the railroads was 25 per cent with a maximum of four cents per 100 lbs. This maximum was not proposed because of water competition, but because of commercial competitive conditions existing within the East, in the vicinity of the major steel-producing points. In this particular case, the commission authorized an increase of 20 per cent with a maximum of 10 cents per 100 lbs., as against the 4 cent maximum proposed by the railroads, and the railroads are putting the 10 cent increase into effect on January 1.

"The fact that there is outstanding an order of the Maritime Commission (U. S. Maritime Commission Docket No. 514, Intercoastal Rate Structure, April 9, 1940, continued in effect in I. C. C. 28622) which provides minimum rates for the intercoastal services is an indication that competition among the shipping lines themselves is a more potent force in holding water rates to the levels complained of than is any pressure or squeeze of low rail rates.

"As you are of course advised, this whole subject is now before the Interstate Commerce Commission on an application from the Maritime Commission, supported by the steamship lines. No doubt the commission will develop all facts relative to the situation and take appropriate action."

Parkes to Address Atlantic States Shippers Board

Holcombe Parkes, vice-president of the National Association of Manufacturers, will be the principal speaker at the twenty-third annual meeting of the Atlantic States Shippers Advisory Board at the Biltmore Hotel in New York City on January 9. Mr. Parkes will address the luncheon sponsored jointly by the shipper organization and the Traffic Club of New York, and his subject will be "Where Do We Go from Here?"

Highlights of the business session of the Shippers Board will include a talk on the national transportation situation by Warren C. Kendall, chairman of the Car Service Division, Association of American Railroads; the election of officers; and the presentation of committee reports.

Joseph A. Quinlan, president of the board and vice-president of the St. Regis Paper Company, will preside. On January 8, six committees of the board will hold preliminary meetings at the Biltmore.

Amazing Variations in Enginemen's Lot

From privation to Packards, from \$25 to \$750 monthly, is 18-nation range

No matter where he lives, the locomotive engineer is above the average worker in skill and in earnings, but a recent survey of the economic position of typical enginemen in 18 countries discloses striking disparities in the scale of living to which they must conform. This survey, conducted by the New York Times, was the subject of a two-page special article in that newspaper's issue of December 26, 1946.

Commenting editorially on certain aspects of the study, the Times said: "What strikes an American in this gallery of personal and family portraits is the fact that we are looking at individuals. The locomotive engineer cannot be pinned neatly into a category. His worries, deprivations, hopes and resentments are all his own. As, like Casey Jones, he climbs into his cab with his orders in his hand it is hard to think of him in masses."

The symposium reveals, nevertheless, striking contrasts between the conditions under which the engineman lives in countries like Sweden and the United States, on the one hand, and Spain and India, on the other. While he has to "scramble for food" in some countries, especially those where the recent war's dislocations were greatest, in others he enjoys relative luxury, although only in the United States, apparently, is it taken for granted that he should own an automobile and his wife a fur coat. The following excerpts from the New York Times article are published by permission:

Argentina—An average Argentine-born engineer, Juan has acquired his tiny but amazingly well-decorated house with a living room, two bedrooms, a kitchen of the most modern facilities and the typically Argentine small garden. He talks things over with his friends in the railroad union recreation hall, has friends in to dinner, listens much to the radio and occasionally goes to a movie. He is proud of Argentina and is glad the schooling for others in his neighborhood has been extended from the fourth grade, which he attended, through the sixth. He teaches at a school for young engineers run by the union and widely reads domestic and foreign technical books and novels.

"Juan earns 376 pesos (about \$100) a month. 'I'm pretty lucky to live here,' he says. 'This part of the world has a great future. I don't like the fact that the cost of living has risen for me about 60 per cent over pre-war prices, but I'm still luckier than the average man elsewhere. I own this home and all the furniture—that's about all I do own—but I really have nothing to worry about.'

Juan is "apolitica." This, he explains, means that he doesn't belong to any party or involve himself in politics. "But," he volunteers, "there are two trends in Argentina, one Nazi-Fascist and one democratic.

I'm a democrat." Although he is "apolitica," this one word in Argentina is enough to throw Juan, who is 52 and has thirty-five years' service on the railroad, out of his job.

Austria—Karl is somewhat more fortunate than most of his fellows. He has a living room, bedroom, kitchen and another room for his 22-year-old daughter, who works in a textile factory. He can't afford to go to the opera nowadays; back in the "good days" before 1934 he went perhaps twice a week. None of the others in the roundhouse office raised an eyebrow at this. Karl is a Viennese Socialist, reared on the idea of culture for the worker, and he would have been ashamed to concede that any kind of literature, music or drama was too refined for him.

Karl considers his income good: 320 schillings a month base pay and about 100 schillings in extras when working full time. At the official exchange rate, that comes to \$42 and dwelling. The money pays for food, light, gas, a movie for his family about once a week, government old-age unemployment insurance, sickness benefits, a contribution to his party and union dues, and that's about all.

He talked about food. In Vienna everyone talks about food half the time. He said he lost seventy-four pounds since Hitler took Austria, in 1938, though railway physical examinations have shown nothing the matter with him except undernourishment.

In the matter of eating, manual workers in jobs so essential as railways are the aristocracy.

Showing the pride of a man with a solid position in life before the war Karl had two suits of regular clothes, two of working clothes and fourteen pairs of shoes. He is wearing his last pair of boots and has one suit of regular clothes and one of work clothes. Both suits have been patched and repaired several times.

Belgium—Armand was grimy, unshaven and weary after the all-night run to Charleroi and back. It had been much the same for months. His engine, which he had handled for years, was as balky as ever and seemed unable to get up enough pressure for the uphill climb into Hainault. Mechanical troubles persisted and again they were 16 minutes late getting in.

Most of his life revolved around the locomotive and his family. The Lardinoises lived in a four-room ground-floor apartment that cost \$10 a month.

Armand has simple tastes and is incredibly hard-working. He earns \$1,500 a year and bonuses of \$25 monthly, which balances deduction for taxes, social insurance, pension, etc. He spends \$40 a week on meals, resorting to the black market only when necessary for such items as butter, meat and milk. Gas and electricity are about \$5 a month. The coal ration, a quarter of a ton a month, averages \$6.85. "I started with nothing but my two hands, and now, after 23 years, that's still all I've got," he explains. "Other people are a lot worse off."

Over a span of the next ten years, when he is due for retirement at 55, Armand will merit three more pay rises. He is on duty eight hours a day but his actual working time is closer to ten hours. A Belgian engine driver gets eight days' holiday a year, one

day off in every eight and national fete days.

Brazil—Senhor Batista drives a locomotive that was built in the United States. He has worked for the Brazilian Central Railway 25 years. "I worry, all right," he says, but "despite that I find time to enjoy life, take my wife and kids to the movies and the theatre, and we have picnics."

Senhor Batista complained with reason about his pay. He earns 2,250 cruzeiros, or \$112 a month. In his village that is worth about what \$50 a week is worth in the United States. From this salary is deducted \$10 a month, his share for the disablement, retirement and old age pension fund.

"I buy a suit of clothes a year; most of my time I spend in overalls. Shoes last me a long time—I buy a new pair a year—but my wife is more extravagant."

Senhor Batista works twice a week, 24 hours each time. "After this I rest 48 hours, but I also work about the house," he said.

He loves his house. "It is almost paid for," he said. "I bought it on the government buy-a-house plan. I borrowed \$1,500 and I pay into the railroad employees saving bank \$16.10 a month toward amortization."

The average meal of the average Brazilian consists of black beans, dry beef and rice, but on Sundays the Batistas have something else on the table, even though it is modest. His food costs about \$60 a month.

China—Mr. Hsia, handsome, big-boned and 36, has been for a year and a half a locomotive engineer for the Nanking-Chengchow section of the government-owned Nanking-Shanghai railway. On his salary of \$280,000 Chinese a month, about \$45 U. S., he can just manage to support his family of seven. The entire family, his elderly parents, his wife and his two sons and a daughter sleep, eat, live and cook in a dingy one-room hut in Nanking that measures eight by ten feet.

Mr. Hsia is neither proud of nor satisfied with his little home. For it he pays fifty catties of rice a month, which now cost about \$5 U. S. Inflation raises the price of rice each month. "The rent would be more," he explains, "if the hut didn't have a straw thatch roof."

Mr. Hsia is not satisfied with his family diet, which consists of rice and a few vegetables.

"Meat?" he says, "that's joking talk. We eat meat at the most once a week. Occasionally, we buy a small, stale fish." Rice, the family staple, costs \$60,000 to \$100,000 Chinese a month, \$10 to \$15 U. S.

The Hsia family indulges in only two luxuries. One is celebrating simply the Chinese traditional feast days, such as New Year's, when Mr. Hsia receives a bonus of an extra month's pay. This year Mr. Hsia intends to use the bonus to buy the children new clothing. The other luxury, a real and big one, is the education of the two Hsia sons. Unlike most Chinese engine-drivers, Mr. Hsia can read and write and appreciates the need for education. He sends his sons to school at a cost of about \$1,040,000 Chinese, or \$170 U. S., a year.

Mr. Hsia makes less in terms of purchasing power now than he did during the war. A locomotive washer in 1922, he had risen to engineer just as the Japanese

war began. He belongs to a union, which is government-controlled. He takes some interest in politics.

Egypt—Mohammed works eight to fourteen hours a day and gets £20, or about \$80 a month. With this he must support his wife and five children. Some of the engineers have two and three wives, but Mohammed decided long ago that one was all he could handle.

He lives in a native quarter of Cairo, where he has three rooms that resemble a dusty antique shop. His quarters are clean, however, and his family reasonably happy, considering its economic limitations.

Mohammed has one suit of clothes, which he purchased before the war. He could not think of buying a new one at the current inflated prices. Asked about workmen's compensation, he said, "If I suffer a permanent deformity, such as damaging my hand, I receive £20, but if I am killed, my family receives £70. I also am allowed 45 days' leave for illness each year."

His leisure time, and there is not much of it, is spent at home. He does not drink, as his religion forbids it. He smokes a "hubble bubble," a Turkish-type pipe that resembles a water-filled vase. "When I finish work I feel tired and need a rest at home among my children," he said. "To go out means money, and money is needed for more important things."

Mohammed isn't really unhappy, although he looks it. However, he thinks that with all the effort he puts into life he should be getting more out of it. He is not interested in local politics and doesn't blame his ever-changing government for his plight. But he feels that somewhere, somehow there must be some agency in this world that can correct the evils that beset him and his family.

France—What worries Robert is not the difficult problem of supporting his family in Paris with its wildly inflated prices on \$33 a week. What bothers him is not his own troubles at all but the situation in France. He is serious about his politics, for he is not only a typical Frenchman but a militant Socialist. He believes ardently in the Socialist ideal, the Socialist party and its leaders.

Robert's home is in a poor, working class quarter of Paris. Through a dark passage into the almost medieval courtyard and up five flights of primitive stairs one reaches their plain but clean and neat two-room-and-kitchen apartment. It is warmed by a kitchen stove that heats the adjoining room fairly well. As a locomotive engineer he enjoys a priority on a little coal.

The home is not uncomfortable, but it is marked by an austerity that would be considered grim poverty by most Anglo-Saxons. To some extent this impression would be mistaken. The French as a rule spend notoriously little on rent, preferring to put the saving into good food or a three-week vacation at the seaside.

Robert spends only 2,000 francs a year, about \$17, for rent. His family eats well. To do so costs more than half his salary, 16,000 francs, or about \$133 a month. He spends 1,000 francs a week for meat.

In another four years Robert, who is 46,

will be able to retire on a pension. That is one reason that he is so worried about the situation in France. "We have some little economies saved up," he says, "and some day we'd like to build that little house on the banks of the Marne. But what if the franc collapses?"

Germany—Hermann is 62 and has been a locomotive engineer for the German State Railroads for the last 36 years. His total railroad service covers 42 years. He hates his work and hasn't much good to say about life in general. He does well, so far as food is concerned. He has a No. 1 ration card, which means about 50 per cent more calories than the standard, or No. 5 card.

What irks Hermann isn't food but the conditions of his work. He's on duty 36

(Continued on page 126)

New Pennsylvania Coach-Train Equipment Exhibited

Four new coaches, the first part of an order of 93 coach, lounge, dining, special-feature and observation cars being built at the Pennsylvania's Altoona shops to re-equip completely "The Trail Blazer" and "The Jeffersonian," have been shown to representatives of the press during the past two weeks at the principal cities along the routes of these overnight coach trains running between New York and Chicago, and New York, Washington and St. Louis, respectively. Features of the coaches that are designed to give greater comfort to overnight coach travelers in comparison to that of the equipment now in service include a more spacious seating arrangement, better circulation of conditioned air, more roomy lounges, new entrance and exit arrangements with pneumatically operated end doors, improved fluorescent lighting and a public-address system.

The coaches are 85 ft. long, with a seating capacity of 44 as compared with the older 80-ft. cars seating 56. Each car has two lounges, each equipped with two private toilets, three wash basins and a dental bowl. The women's lounge is furnished with a sofa and a vanity dresser; the men's lounge with a larger sofa instead of the vanity.

Conditioned air enters the coach through a center ceiling duct and is drawn from the car by two ducts covered with perforated material located along the underside of the baggage racks. Between the two ducts and running the full length of the racks are fluorescent lights for reading.

Indirect lighting is furnished by fluorescent lights hidden from view along the intersections of the tops of the baggage racks with the side walls.

The car entrances are arranged with the doors on the left side of a U-shaped space set into the car body structure and permitting the passengers to step off the end platform before entering the car. All end doors are operated pneumatically and are controlled by pressure on a bar from the outside and by pulling the door handle on the inside. Only one end of each car has a vestibule and steps for boarding the train.

The seats are of the reclining type with foot rests attached to the fixed base instead of to the seat itself. They are spaced on 44-in. centers and are reversed by being rotated after they are unlocked by sliding a few inches toward the aisle. The six-foot windows are divided at the center by a narrow post to permit individual control of the two shades with which each window is equipped.

The public-address system is comprised of a loud speaker at one end of each coach which will be connected to microphones located in the club, dining, and observation cars. One other special feature is the no-smoking signs built into the end mirrors and illuminated by fluorescent lights. When the lights are turned off the signs become invisible in the mirrors.

All-welded construction utilizing high-strength steels was employed in fabricating the cars. The trucks are of the four-wheel type and are equipped with roller bearings. The cars were designed by the railroad's mechanical department and styled by Raymond Loewy Associates.

"Short Course in Railroading"

Under the general classification, a "Short Course in Railroading," the Katy Employees' Magazine has undertaken the publication of a series of articles intended to give Missouri-Kansas-Texas employees a better understanding of the financial and economic conditions that influence a railroad's welfare, and particularly of those aspects of corporation financial operations about which many employees appear to be gravely misinformed.

The first articles in the series are by J. T. Mahaney, comptroller of the M.-K.-T. The initial discussion explains through comparisons with family financial routines what a corporation is and how its financial transactions are carried out. A corporation, Mr. Mahaney tells Katy employees, "is a rather mysterious thing to many indi-

viduals. Corporations are thought of by some as 'monsters' brought into being by rich people for the sole purpose of making the rich richer and the poor poorer. Others think that corporations have a never-ending supply of cash and it is only a matter of choice by directing heads of the corporation, how much, when, and for what purposes that fountain of cash will be paid out." How far these impressions differ from reality is then explained.

Shippers Board Meetings

The Ohio Valley Transportation Advisory Board will hold its 23rd annual, and 80th regular, meeting on January 7 and 8, at the Gibson Hotel, Cincinnati, Ohio. This meeting was originally scheduled for December 9 and 10, 1946, but was postponed due to unsettled conditions caused by the coal strike.

Car Service Orders

Interstate Commerce Commission Service Order No. 662, effective from December 28, 1946, until February 10 unless otherwise modified, establishes a permit system for the transportation of export corn consigned to any elevator at or for direct delivery to vessels at the ports of New Orleans, La.; Port Arthur, Tex.; Texas City, Galveston, or Houston. F. S. Keiser, 209 South Wells street, Chicago, is permit agent.

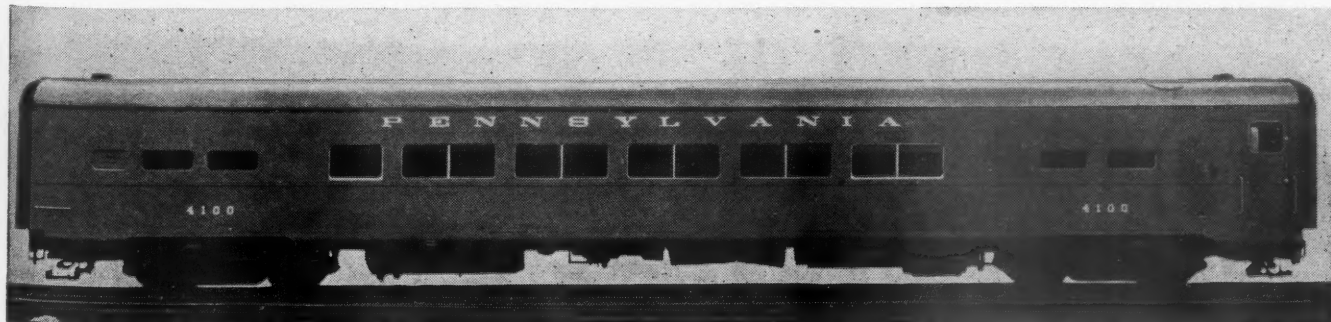
Amendment No. 1 to Service Order No. 562 postpones, from December 31, 1946, until April 30, the expiration date of that order under which H. C. King, deputy director of the Office of Defense Transportation, functions as I. C. C. agent with authority to reroute freight traffic and empty cars to avoid congestion. Amendment No. 3 to Service Order No. 624 postpones, from January 1 until March 1, the expiration date of that order which maintains the permit system for the movement of export grain through North Atlantic ports.

Several other service orders, which were scheduled to expire with the close of 1946, have been amended by the commission to make their expiration dates June 30. They are:

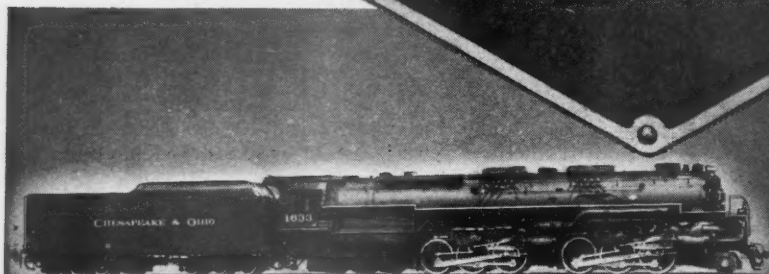
No. 68 which prohibits furnishing two small cars for a larger car ordered and suspends tariff rules which permit application of minimum weights lower than those provided for the car used, except flats.

No. 93 which provides for the use of giant refrigerator cars at freight rates applicable on the same commodities loaded in standard refrigerator cars.

No. 95 under which C. W. Taylor, manager, Refrigerator Car Section, Car Service Division,



One of the Pennsylvania's 85-ft. coaches with seats for 44 passengers designed for service in "The Trail Blazer" and "The Jeffersonian"



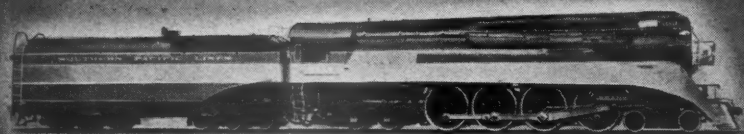
Chesapeake & Ohio 2-6-6-6



Virginian 2-6-6-6



Chesapeake & Ohio 2-8-4



Southern Pacific 4-8-4



Nickel Plate 2-8-4

A FAMILIAR SYMBOL

at home.

The famous "Lima Diamond", a symbol of skilled workmanship and efficiency in operation, has become a familiar sight on foreign as well as domestic railroads.

On the right, one of the 280 Lima-built steam locomotives recently completed for the French Railways is being loaded aboard the "Harold Torsvik" of Oslo, in Baltimore, Md. These 2-8-2's were specially designed to meet the requirements of France whose transportation system was decimated by the war.

On the left is illustrated a representative group of Lima-built power for domestic use. These locomotives, from the 2-6-6-6 super-freight for the Chesapeake & Ohio to the 2-8-4 for the Nickel Plate, are effectively demonstrating that Lima Steam Power is capable of hauling heavy loads at the sustained speeds that modern requirements demand.

LIMA LOCOMOTIVE WORKS



INCORPORATED, LIMA, OHIO

Association of American Railroads, functions as I.C.C. agent to control the distribution and use of refrigerator cars.

No. 107 (revised) which requires the Car Service Division, A.A.R., to control the movement of freight cars into Mexico so as to equalize the interchange. The A.A.R. has announced that C.S.D. Embargo No. 400 will be continued in effect in order to carry out this requirement.

No. 244 (second revised) which prescribes rules for the distribution of grain cars at country loading points in periods of car shortage.

No. 260 which prohibits salting of ice in refrigerator cars handling citrus fruits from California, Arizona, Texas, and Florida.

No. 434 which restricts the free time on box cars held for unloading at ports to a maximum of seven days.

New York Central Is Relieving Little Falls Curve

One of the major post-war projects of the New York Central is eliminating the so-called Gulf curve at Little Falls, N. Y., involving the diversion of the Mohawk river into a new channel and the construction of more than a mile of four-track railroad. By this project the curve will be reduced from curvature of 7 deg. 24 min. to 1 deg. 30 min. The work is expected to be completed and new track placed in operation in September, 1947.

Through the elimination of the present sharp curve, which has necessitated a slow order of 45 m. p. h. for many years at this point, trains can proceed without reducing divisional speed. In straightening the tracks, this section will be relocated approximately 340 ft. southward at the apex of the present curve. As a result, they will pass over a tip of an island artificially formed when the state barge canal bypassed the falls from which the city receives its name. To make this possible the river will be straightened by cutting a new channel across the middle of the island. This will then permit filling the present channel and construction of the railroad on an embankment.

Actual work of clearing the new right of way began in September, 1946. In creating the new channel 138,000 cu. yds. of excavation, mostly gneiss rock, will be removed. The new channel will be 20 ft. deep at average water level, 600 ft. long and 150 ft. wide. Rock from the new channel and rock borrow will be used to

fill the old channel to a point 21½ ft. above average water level. A gravel embankment, approximately 20 ft. high above the rock fill, will then be constructed for the railroad.

The total length of the new section of railroad will be 6,300 ft. In addition to the new embankment, two four-track bridges will be built. All contract work including excavation, grading and construction of the embankment and bridges, is being carried out by the Walsh Construction Company at a cost of approximately \$2,000,000, and is exclusive of track and signal work which will be installed by New York Central forces with further expenditure of \$500,000.

Gulf curve was originally constructed on the line of the old Utica & Schenectady. Opened in 1836, it was one of ten early roads between Albany and Buffalo which consolidated in 1853 to form the New York Central. Despite the safe operation for many years of all trains at this point under slow order, the human element of miscalculation could not be entirely removed. Unfortunately, this human element caused the serious wreck of the "Lake Shore Limited" in April, 1940, with the immediate result that plans for the elimination of this curve were made. Because of war-time shortages, however, the project had to be delayed until the present time.

Conference Jan. 17 in Water-Competitive Rate Probe

The Interstate Commerce Commission has shifted one day, from January 16 to January 17, the prehearing conference in the recently-instituted investigations of transcontinental rail rates and intercoastal water rates. As noted in the *Railway Age* of December 21, 1946, page 1058, the investigations, Nos. 29663 and 29664, comprise part of the commission's response to the United States Maritime Commission's complaint against water-competitive rail rates.

The change in the date of the prehearing conference had been requested by H. C. Barron, counsel for the Western Traffic

Executive Committee; and I. C. C. Chairman Aitchison this week made public his reply to letters wherein Mr. Barron had made that request and certain suggestions with respect to the conference. The latter included a suggestion that the agenda for the conference be prepared in advance.

While Chairman Aitchison said in reply that the commission's rules of practice should serve as a general guide for the conference proceedings, he nevertheless went on to comment briefly on what the applicable rules indicated would be pertinent subject-matter.

"The broad issue here, of course," Mr. Aitchison said, "is whether certain all-rail and all-water rates are unreasonably low. By the initial orders shippers have been put on notice that proposals will be made to increase some or all of those rates. However, thus far to my knowledge they have not had any intimation as to the size of the increases which will be proposed. It seems to me highly desirable that the shippers and other interested parties should be given some information even of a tentative nature on this point as soon as possible in order that they may be in a better position to prepare their evidence without undue delay. I therefore hope that the water carriers, who have been the moving parties, may be able to make a statement on this phase of the case at the conference."

Mr. Aitchison then called attention to section 5(b) of the Administrative Procedure Act which requires administrative agencies to afford all interested parties "opportunity for (1) the submission and consideration of facts, arguments, offers of settlement, or proposals of adjustment where time, the nature of the proceeding, and the public interest permit. . . ." He went on to say that the question of whether the proceeding is of such nature that "offers of settlement or proposals of adjustment" would be appropriate could be discussed at the prehearing conference.

"The broad scope of these proceedings," he also observed, "raises the question whether the rates to be investigated are properly described in the orders, whether the territorial application is too wide or perhaps not wide enough in some respects. Also the question may arise whether a sufficient number of commodities are included, or on the other hand, whether it might not be preferable to limit the commodities to the most important ones, e.g., lumber, canned goods, and dried fruits east-bound, and iron and steel articles west-bound."

Shippers Boards Expect Higher First Quarter Loadings

Freight car loadings in the first quarter of 1947 are expected to be 8.8 per cent above those in the same period in 1946, according to estimates by the 13 Shippers Advisory Boards.

On the basis of those estimates, loadings of the 32 principal commodities will be 7,091,603 cars in the first quarter of 1947, compared with 6,515,810 actual car loadings for the same commodities in the corresponding period last year. All of the 13 boards estimate an increase in carload-



Curve elimination on the New York Central

The Sharp Gulf Curve in the main line of The New York Central at Little Falls, N. Y. is now being eliminated in a major postwar project involving re-channeling the Mohawk river. The checkered line locates the new section of the four-track railroad. The new river channel will be blasted between the dotted white lines.

ings for the first quarter of 1947 compared with the same 1946 period.

The tabulation below shows actual loadings for each district in the first quarter of 1946, the estimated loadings for the first quarter of 1947 and the percentage of increase.

| Shippers' Advisory Boards | Actual Loadings First Quarter 1946 | Estimated Loadings First Quarter 1947 | Per cent Increase |
|---------------------------|------------------------------------|---------------------------------------|-------------------|
| New England | 140,617 | 145,010 | 3.1 |
| Atlantic States | 597,282 | 678,745 | 13.6 |
| Allegheny | 1,026,493 | 1,095,530 | 6.7 |
| Ohio Valley | 987,078 | 1,024,604 | 3.8 |
| Southeast | 788,146 | 876,077 | 11.2 |
| Great Lakes | 279,893 | 370,440 | 32.4 |
| Central Western | 289,769 | 317,883 | 9.7 |
| Mid-West | 851,905 | 900,769 | 5.7 |
| Northwest | 278,411 | 285,357 | 2.5 |
| Trans-Missouri-Kansas | 360,934 | 378,075 | 4.7 |
| Southwest | 431,133 | 450,210 | 4.4 |
| Pacific Coast | 285,163 | 338,715 | 18.8 |
| Pacific Northwest | 198,986 | 230,188 | 15.7 |
| Total | 6,515,810 | 7,091,603 | 8.8 |

The 13 boards expect an increase in the first quarter compared with last year in the loading of 28 of the commodities listed, and a decrease in 4. Among those showing the greatest increases are the following: Vehicle parts, 106.7 per cent; automobile and trucks, 95.9 per cent; agricultural implements and vehicles, other than automobiles, 47.3 per cent; machinery and boilers, 36.3 per cent; iron and steel, 35.0 per cent; ore and concentrates, 29.5 per cent; frozen foods, 26.2 per cent; cement, 22 per cent; lime and plaster, 21 per cent; metals other than iron and steel, 20.3 per cent; brick and clay products, 18.3 per cent; fresh fruits (except citrus), 16.2 per cent; food products in cans and packages, 13 per cent; lumber and forest products, 12.8 per cent; gravel, sand and stone, 12.2 per cent; all grain, 10.2 per cent; citrus fruits, 9.7 per cent; and coal and coke, 2.1 per cent.

Commodities for which decreases are estimated and the amount of the decrease include the following: cotton, 9.5 per cent; hay, straw and alfalfa, 9.4 per cent; livestock, 2.1 per cent; and fresh vegetables, other than potatoes, 1.7 per cent.

Small Makes Final Report to President

(Continued from page 114)

railroad car builders. A goal of approximately 7,000 cars per month for the balance of 1946 and throughout the year 1947 was set. Formal directives were issued to provide steel for increased production of high pressure tank cars for the transportation of anhydrous ammonia and liquefied petroleum gas."

The report said that the production of freight cars for domestic roads increased 65 per cent from 3,122 units to August, 1945, to a post-war high of 5,141 cars in the comparable 1946 month, but dropped to 3,828 in October.

Continuing, the report pointed out that the production of passenger cars of standard types was discontinued during the war. And deliveries on contracts for troop sleep-

ers and kitchen cars dragged into the second quarter of 1946 because of strikes in plants of component suppliers, thereby delaying a "reconversion program" based upon orders for over 2,000 "ultra-modern" civilian passenger cars.

According to the report (as of December 6), production of civilian passenger cars amounted to 23 units for the last four months of 1945 and 330 units during the first 10 months of 1946, the total amount of unfilled orders being 2,500 cars. It again attributed the lack of production to shortages of components and specialties such as electric motors and generators, air conditioning equipment, special seats, lighting equipment and hardware specialties, noting further that "storage spaces are reported to be full of empty car shells awaiting installation of special equipment."

Brake Shoes Critical—The report also revealed that shortages of railroad car brake shoes "became apparent" in the fall of 1945, but were not "sufficiently severe" at that time to interfere with rail operations. It said that subsequent strikes in foundries, steel plants and coal mines interfered "so seriously" with production that brake shoes were put on the "critical list," and that in March, 1946, the C. P. A. took "informal action" to schedule delivery of steel sheet and bars to brake shoe foundries.

"However, the spring coal strike nullified this effort, and the continuous decline in production which started in January continued through July," the report pointed out. "In August, the placement of brake shoes on both Directions 12 and 13 to M-21 assured brake shoe producers of the necessary supplies of steel and pig iron. Assistance for brake shoes was continued for the fourth quarter of 1946 and the first quarter of 1947 when Direction 18 to PR-28 replaced Direction 12 to M-21, and Direction 13 to M-21 was extended."

The report said that production of brake shoes in August exceeded that of the previous month, and that September production showed a higher daily rate of production than August, "although the total output declined 2 per cent because of the fewer number of working days." It added that output during October—the "best month" of 1946—was 23 per cent above the September level, and that current priority directives will assure an adequate supply of brake shoes "at least through March 31, 1947."

Canadian Rate Increase Case Put Off to February

A majority decision of the Board of Transport Commissioners at Ottawa last week postponed from January 8 to February 11 the hearing of an application by the Canadian railways for a 30 per cent increase in their freight rates that would add an estimated \$85,000,000 to their annual revenues.

Chairman J. A. Cross announced a decision which struck a compromise between the contention of the railways that any delay could have "disastrous results," and that of seven of the provinces that any postponement of less than three months

would not give time to make an adequate preparation of their case.

The five-man board deliberated an hour after listening to more than four hours of argument by spokesmen for the transportation commission of the Maritime Board of Trade and the four western provinces and, on the opposite side, to representatives of the Railway Association of Canada and the Canadian National and Canadian Pacific.

When they emerged, Colonel Cross said a majority had decided that the request for a three-months adjournment "would have the effect of delaying the proceedings to too great an extent." Alternately a lesser adjournment would be granted.

The board had been influenced by the fact that one of the counsel had been retained only recently. The chairman urged the provincial representatives to state specifically just what statistical material they wanted from the railways. If the railways were not agreeable then an application to the board for a ruling should be made as quickly as possible.

His statement brought forth a certain spirit of acrimony that had underlaid the proceedings. It pivoted on the provinces' request for certain statistical information they considered necessary to enable them to prepare their case, consisting of a list of particulars of estimates and analyses, with an effort to isolate freight costs and revenues from the other facets of railway income, reserves and expenses.

The request had originally been made in a letter to the railway association December 13, but the association's counsel, C. F. Carson, continued the argument on its viewpoint that much of the information was not pertinent to the application for increase, that the actual hearing should be started and railway witnesses produced to supply any and all information the board considered relevant to its inquiry. Preparation of the data, he continued, would divert for months staffs now busy preparing the railways' own case.

Counsel for the four western provinces had termed the railways' attitude "intolerant" and "arrogant." Their contention was that since there had been no general freight increase in some 25 years it was unsound for the railways to argue that any further three months adjournment would prove disastrous to firms with war-swollen reserves. The railways had been in far worse position financially in the years before the war.

It was pointed out, on the other hand, that every day's delay would cost the railways an estimated \$300,000 and there was no guarantee that this would be the only delay. On the basis of present rates, the Canadian Pacific alone would fall \$2,500,000 short of meeting its fixed charges in 1947. Since the application had been launched in October 1946 pay increases had upped its cost about \$1,250,000 a month.

Johnson, Assistant O. D. T. Rail Transport Director, Resigns

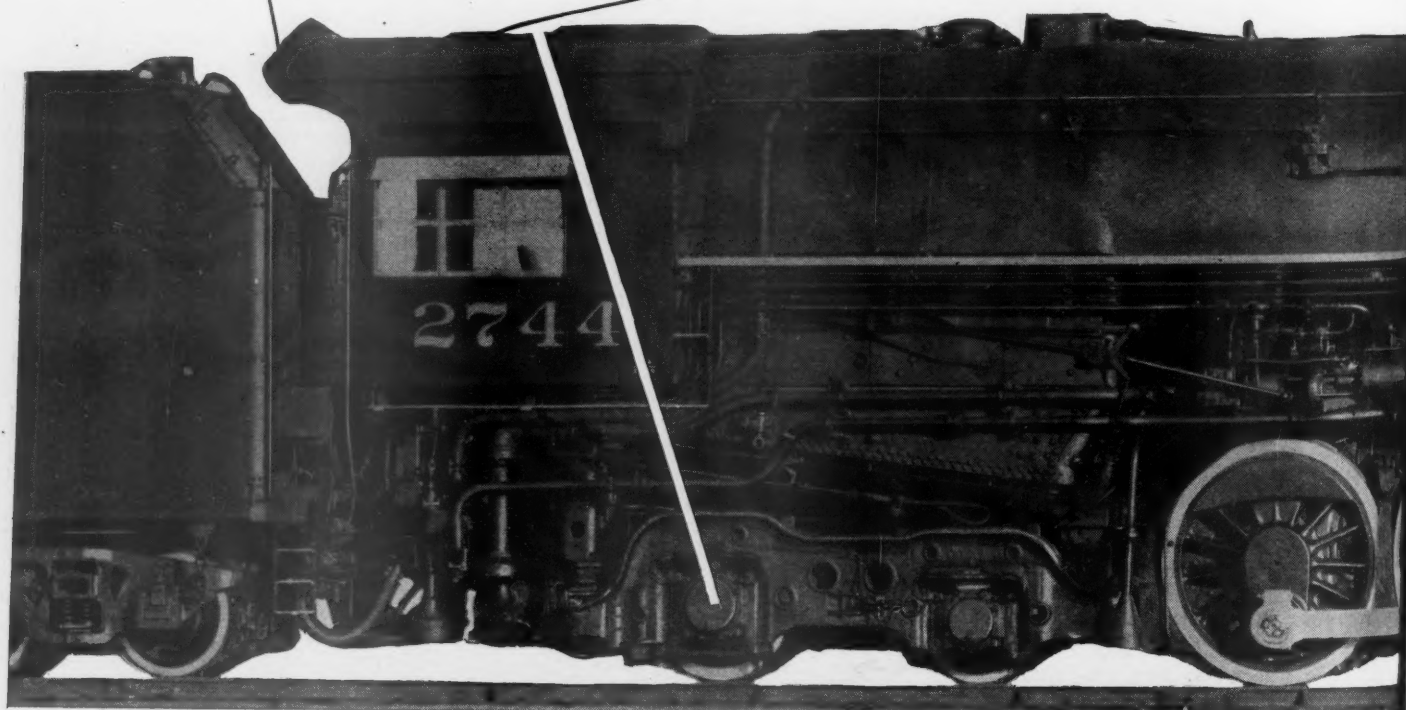
A. S. Johnson, assistant director of the Railway Transport Department, Office of Defense Transportation, resigned effective December 28, 1946. Mr. Johnson, who has been connected with the O. D. T.

TO HELP CONSERVE FUEL

*THE Booster**

The latest Franklin Locomotive Booster will increase the initial drawbar pull of a locomotive by as much as 15,000 pounds, depending on locomotive design characteristics. It is effective up to 30 or 35 mph, can be cut in easily at speeds up to 20 or 22 mph. Improvements over older designs, including use of cast-steel cylinders and of roller bearings on the heavier main crank-shaft, further reduce maintenance and increase dependability. It is equally suitable for new or existing locomotives, freight or passenger.

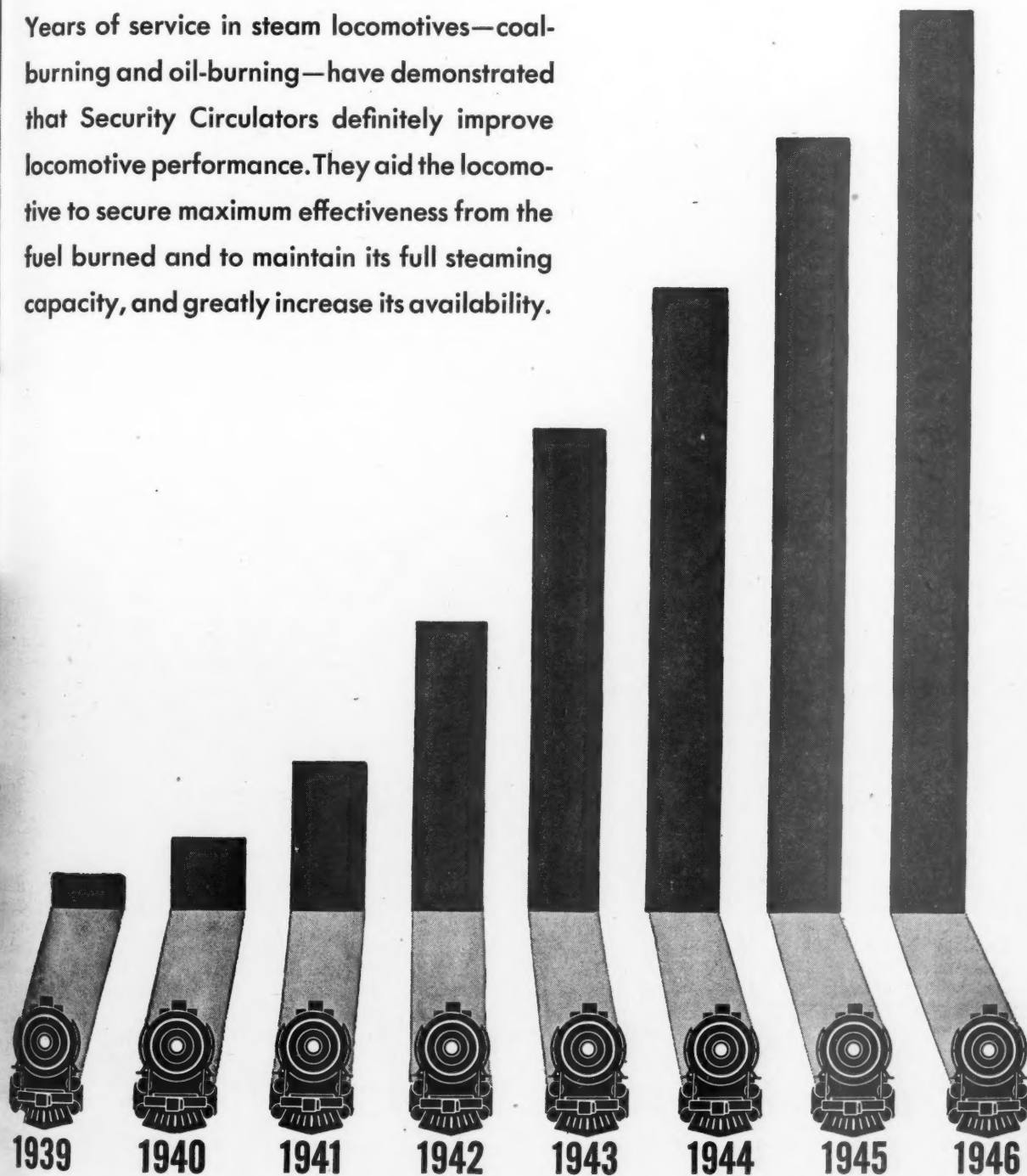
*Trade Mark Reg. U. S. Pat. Off.



STEAM DISTRIBUTION SYSTEM • BOOSTER • RADIAL BUFFER • COMPENSATOR AND SNUBBER • POWER REVERSE GEARS

in Circulator-equipped Locomotives

Years of service in steam locomotives—coal-burning and oil-burning—have demonstrated that Security Circulators definitely improve locomotive performance. They aid the locomotive to secure maximum effectiveness from the fuel burned and to maintain its full steaming capacity, and greatly increase its availability.



since April, 1942, has accepted a position as director of the port of Gulfport, Miss.

According to O. D. T., arrangements have been made with the Gulfport port commission to permit Mr. Johnson to remain in Washington to assist at O. D. T. until grain export for the world food program has passed the "critical" stage.

Freight Car Loadings

Figures for loading of revenue freight for the week ended December 28 were not available when this issue went to press.

Loading of revenue freight for the week ended December 21 totaled 836,181 cars, and the summary for that week as compiled by the Car Service Division, A. A. R., follows:

| Revenue Freight Car Loading | | | |
|--|------------|------------|------------|
| For the Week Ended Saturday, December 21, 1946 | | | |
| District | 1946 | 1945 | 1944 |
| Eastern | 163,481 | 130,312 | 147,306 |
| Allegheny | 171,206 | 145,253 | 164,203 |
| Pocahontas | 67,734 | 49,331 | 46,103 |
| Southern | 138,085 | 110,469 | 119,660 |
| Northwestern | 86,919 | 79,979 | 85,306 |
| Central Western | 139,901 | 115,810 | 127,247 |
| Southwestern | 68,855 | 56,491 | 73,147 |
| Total Western Districts .. | 295,675 | 252,280 | 285,700 |
| Total All Roads | 836,181 | 687,845 | 762,972 |
| Commodities: | | | |
| Grain and grain products | 53,331 | 45,699 | 46,059 |
| Livestock | 15,653 | 16,973 | 15,339 |
| Coal | 198,310 | 157,785 | 157,048 |
| Coke | 14,301 | 13,008 | 13,720 |
| Forest products | 46,521 | 31,089 | 41,545 |
| Ore | 12,492 | 9,606 | 12,035 |
| Merchandise l.c.l. | 122,265 | 105,193 | 100,829 |
| Miscellaneous | 373,308 | 308,492 | 376,367 |
| December 21 | 836,181 | 687,845 | 762,972 |
| December 14 | 828,787 | 771,594 | 750,242 |
| December 7 | 729,084 | 776,376 | 793,156 |
| November 30 | 660,911 | 805,774 | 807,836 |
| November 23 | 806,383 | 716,556 | 768,338 |
| Cumulative Total 51 Weeks | 40,713,238 | 41,412,143 | 42,823,419 |

In Canada.—Carloadings for the week ended December 21 totaled 73,380 cars, as compared with 74,373 cars for the previous week, and 64,698 cars for the corresponding week last year, according to the compilation by the Dominion Bureau of Statistics.

| | Revenue Cars Loaded | Total Cars Rec'd from Connections |
|-------------------------------|---------------------|-----------------------------------|
| Totals for Canada: | | |
| December 21, 1946 | 73,380 | 36,463 |
| December 22, 1945 | 64,698 | 33,365 |
| Cumulative Totals for Canada: | | |
| December 21, 1946 | 3,633,507 | 1,768,555 |
| December 22, 1945 | 3,572,083 | 1,781,588 |

The General News Department is continued on page 126.

SIMPLE JUSTICE.—The railroads are looking to the future, to the changes which advancing technology is bringing, and to the better service which continued investment in plant and equipment will make possible. They should be assured of such governmental policies as will encourage rather than hinder the development of the better transportation service which they can and should render.—*W. G. Volmer, president of the Texas & Pacific.*

Supply Trade

The American Mat Corporation has announced the opening of a new plant at Franklin, Mass.

The offices of the Chicago Railroad Supply Company have been moved to 215 West Ohio st., Chicago 10.

The Simplex Wire & Cable Co. has announced the appointment of W. W. Lancaster as sales representative in the New Orleans, La., area, under the supervision of A. K. Felix, southern district manager.

The Drott Manufacturing Corporation has announced the completion of new office and manufacturing buildings at 4344 North Green Bay avenue, Milwaukee 12, Wis.

Willard K. Fohl has been appointed manager of the railroad division of the Lukens Steel Company and its subsidiaries, the By-Products Steel Corporation and Lukenweld, Inc., Coatesville, Pa. Mr. Fohl joined Lukens in 1937, serving in the research and open hearth depart-



Willard K. Fohl

ments until 1939, when he was appointed assistant research metallurgist. During World War II, he served with the United States Navy, returning to Lukens in November, 1945. He is a member of the New York Railroad Club and the Master Boiler Makers' Association.

Arthur Tuckerman, former assistant to executive vice-president Charles J. Hardy, Jr., in the field of public relations for the American Car and Foundry Company, has been appointed director of public relations.

As part of its \$4,000,000 expansion program, the Minneapolis-Honeywell Regulator Company, Minneapolis, Minn., has announced the leasing of a two-story building for the company's enlarged sales school and research department.

Charles A. Benz, in addition to his other duties as general sales manager, will be placed in charge of all engineering and development work for the Chicago Malleable Castings Company and the Al-

lied Steel Castings Company, at Chicago, effective January 1.

The Graver Tank & Mfg. Co., East Chicago, Ind., has purchased the Banks Moreland Company of Houston, Tex., which will be operated under that name as a division of Graver Tank. Banks Moreland has been appointed a vice-president of Graver Tank and will manage the new division.

Interchemical Corporation has announced the transfer of the business and personnel of Scriver & Quinn, Inc., a west coast subsidiary, to two other divisions. Scriver & Quinn's industrial finishes will be sold by the finishes division and their consumer products will be marketed by Interchemical Corporation-Scriver & Quinn Finishes.

Jack W. Cannon has been appointed railroad sales representative for W. F. Hebard & Co., in the Chicago area. W. F. Hebard, manufacturers of shop mule tractors also are distributors for the Ross Carrier Company, the Hughes-Keenan Company, the Brookville Locomotive Works, the Elizabeth Iron Works, and the Electric Wheel Company.

Kennametal Inc., Latrobe, Pa., has announced the appointment of the Walter R. Hammond Company, 255 Third avenue, South Minneapolis, Minn., as its agent in Minnesota, North Dakota and South Dakota and the Martin Supply Company, 413 South Kenosha street, Tulsa, Okla., as its agent for that state. The appointment of E. J. Conlan as a representative in the Cleveland, Ohio, area of the central district, with headquarters at 860 Hanna building, also was announced.

The Graybar Electric Company has announced the following changes in management: Herbert Metz has been appointed a member of the executive committee and eastern district manager at New York, in which capacities he succeeds W. J. Drury who has retired. A. C. Lamperti has been elected a director of the company and will continue as secretary and comptroller. H. L. Harper, Pacific district manager at Los Angeles, Calif., has been designated a voting trustee, also succeeding Mr. Drury.

H. C. Crawford, former general traffic manager of the Bethlehem Steel Company, has been elected vice-president in charge of traffic, to succeed J. M. Gross, who has retired after 30 years' service. F. M. Huffman, traffic manager, has been appointed general traffic manager, to replace Mr. Crawford.

Mr. Crawford began his career with the traffic division of the United States Steel Corporation. In 1914, he joined the Cambria Steel Company and in 1915 was appointed its eastern traffic manager. He later joined the Midvale Steel & Ordnance Co. serving as its traffic manager until its acquisition by Bethlehem Steel in 1923, at which time he was appointed assistant general traffic manager for Bethlehem Steel. In 1927 he was appointed traffic manager and in 1937 general traffic manager.

ny, at Chi
Co., East
the Banks
ston, Tex.,
that name
k. Banks
ed a vice-
will manage

n has an-
business and
n, Inc., a
other divi-
ustrial fin-
es division
ill be mar-
ion-Scriver

appointed
or W. F.
area. W.
shop mule
r the Ross
nes-Keenan
Locomotive
orks, and

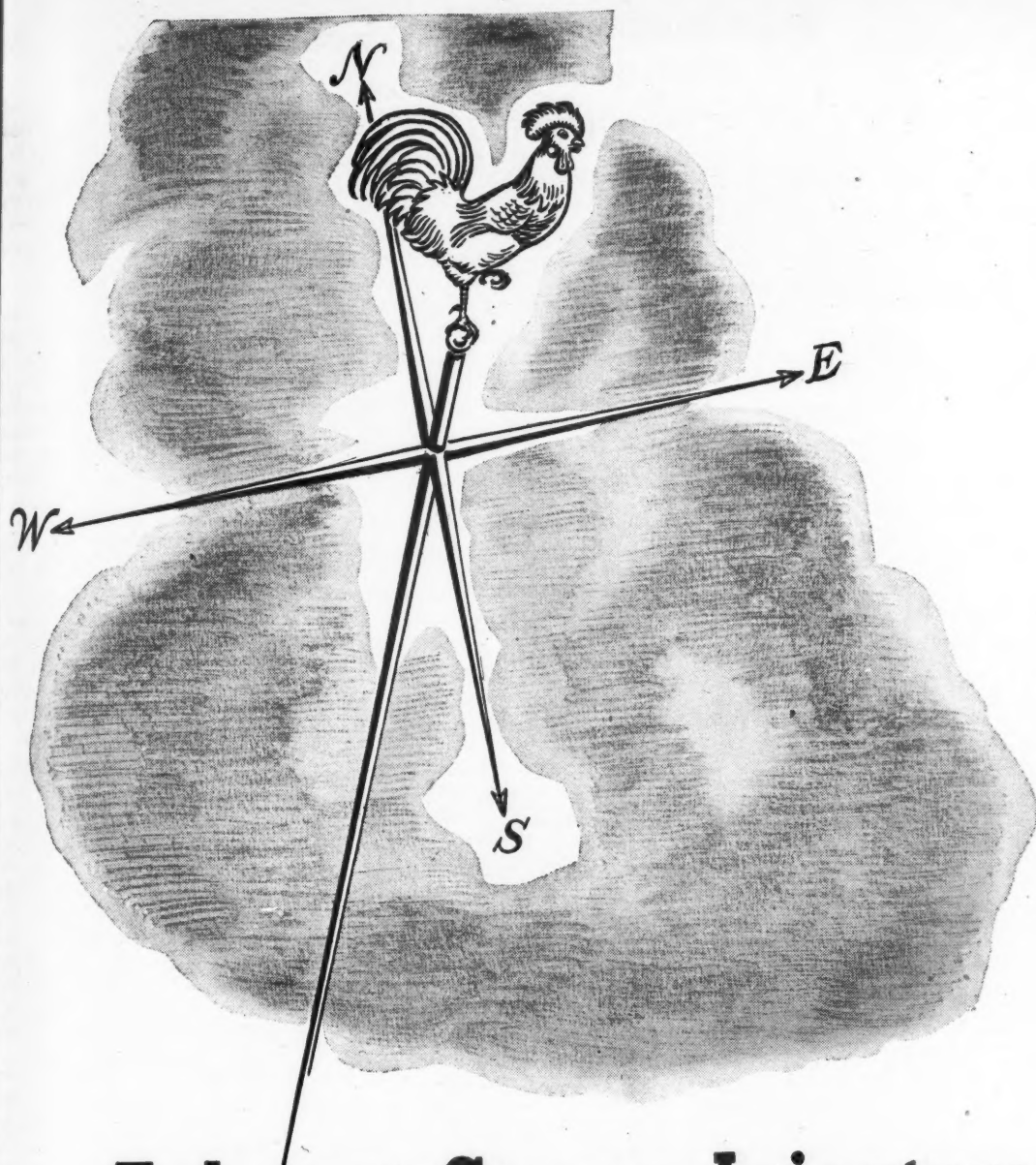
Pa., has
ne Walter
Third av-
n., as its
akota and
n Supply
treet, Tul-
tate. The
as a rep-
Ohio, area
adquarters
announced.

pany has
s in man-
been ap-
itive com-
er at New
ceeds W.
C. Lam-
or of the
secretary
r, Pacific
es, Calif.
ustee, also

eral traffic
el Com-
esident in
I. Gross,
service.
has been
r, to re-

with the
tes Steel
he Cam-
was ap-
per. He
Ordinance
until its
in 1923,
assistant
ethlehem
ed traffic
ffic man-

y 4, 1947



Exhaust Steam Injectors

In Service the World Over

They Improve
LOCOMOTIVE EFFICIENCY
in
ASIA - INDIA - AUSTRALIA - AFRICA - EUROPE
NORTH AND SOUTH AMERICA

KEEP ABREAST OF FEEDWATER HEATER
DEVELOPMENT WITH ELESKO.

THE
SUPERHEATER
COMPANY

Representative of AMERICAN THROTTLE COMPANY, INC.
60 East 42nd Street, NEW YORK
122 S. Michigan Ave., CHICAGO 
Montreal, Canada, THE SUPERHEATER COMPANY, LTD.

A-1835

Superheaters • Superheater Pyrometers • Exhaust Steam Injectors • Steam Dryers • Feedwater Heaters • American Throttles

January 4, 1947

148

OBITUARY

Frederick William Rizer, sales engineer in the New York office of the General Railway Signal Company, died in New York City on November 26.

Warren G. Ferguson, recently retired transportation sales engineer for the General Electric Company, died on December 13, at Riverside, Ill. He was associated with the company for 36 years.

Albert W. Jacobs, former chairman of the board of the Star Headlight & Lantern Co., with which company he was associated for over 54 years, died on November 13, after a long illness. He was 72 years old.

Sydney G. McAllister, who retired in 1940 as president of the International Harvester Company, died in Pasadena, Cal., on December 25, after a lengthy illness. Following his retirement, Mr. McAllister continued as chairman of the firm's executive committee until two years ago, when he relinquished the position because of ill health.

Louis R. Millar, 69, who retired in 1945 as a sales engineer for the Mercury Manufacturing Company, Chicago, died at his home in Los Angeles, Cal., on December 19. Mr. Millar was an employee of the company for more than 25 years and had specialized in the application of mechanized methods for materials handling in railroad freighthouses and steamship piers.

DeWitt R. Arnold, senior vice-president of the Standard Railway Equipment Company, died on December 21. He was 61 years old. Mr. Arnold joined Standard Railway Equipment in 1924 at the Chicago office, holding the position of vice-president until 1936, when he joined the Chicago-Hutchins Company as its president. In 1939 he returned to Standard Railway Equipment as senior vice-president, with headquarters in New York.

Construction

CHESAPEAKE & OHIO-NEW YORK, CHICAGO & ST. LOUIS.—These roads have jointly announced participation with the New York Central and the Baltimore & Ohio in a \$700,000 project at Fostoria, Ohio, for the construction of an interlocking and signal system. The new facilities will, over a period of a year, eliminate 90 per cent of the passenger train stops there, and will advance 3,328 slow freights, handling an average of 139 cars each, 17 minutes apiece. It is estimated that the new signaling will enable two-thirds of all through trains to move through Fostoria without stopping. The Nickel Plate reports that the installations will save 3,200 passenger stops and 10,000 freight delays annually over its tracks. The C. & O.'s share of the complete expenditure will be \$165,000, and that of the Nickel Plate, \$153,000; the remainder of the cost will be divided between the N. Y. C. and the B. & O.

Equipment and Supplies

Rock Island Seeks Improved Suburban Equipment

Aaron Colnon, co-trustee of the Chicago, Rock Island & Pacific, on December 30, 1946, filed a petition before Federal District Judge Michael Igoe at Chicago, requesting authority to purchase two experimental, de luxe, air-conditioned, Diesel-powered suburban trains for service between Chicago and Joliet, Ill. The equipment sought comprises two 1,500-hp. passenger locomotives to be purchased from Fairbanks, Morse & Co., and four three-car articulated, air-conditioned, suburban passenger carrying units from the Pullman-Standard Car Manufacturing Company. Judge Igoe set January 14 as the date for a hearing on the petition.

LOCOMOTIVES

The **READING** has authorized the purchase of 15 Diesel-electric switching locomotives to cost \$1,342,500.

The **CHESAPEAKE & OHIO** has announced its intention of requesting bids on 10 steam locomotives to be used in passenger service. Five of the locomotives, it is contemplated, will be of the 4-8-4 type, each with a tractive force of 64,700 pounds, and five will be of the 4-6-4 type, each with a tractive force of 80,200 pounds. All the new engines will be streamlined and equipped with roller bearings, high-speed boosters, lightweight main and side rods and crossheads. The use of poppet valves is being considered in the case of the 4-6-4 locomotives, which will be put into service between Hinton, W. Va., and Cincinnati, Ohio, and between Hinton and Toledo, Ohio, the C. & O. said. The 4-8-4 engines will be assigned to the trans-Alleghany mountain run between Richmond, Va., and Hinton.

FREIGHT CARS

Steel Strike Would Cripple Freight Car Production

A new steel strike in 1947 would be a body blow at freight car production, which is so urgently needed to alleviate the car shortages now hampering the movement of all types of railroad freight, S. M. Felton, president of the American Railway Car Institute, said last week.

"In recent months an acute shortage of steel has been the major bottleneck of the car building industry and a complete cessation of steel production would have disastrous effects upon car deliveries to railroads and thus upon the nation's whole reconversion program," Mr. Felton stated.

"The production of the car building industry has fallen in the last two months to an average of 2,750 cars, compared with a monthly capacity of 14,000 cars, due largely to inability to obtain steel. The builders ended the month of November with a backlog of 47,898 cars on order and it is antici-

pated that an increased number of orders will be placed by the railroads as the result of the recently granted increase in freight rates.

"The country is desperately in need of new freight cars because relatively few cars were built during the depression years or during the war, and wear and tear on existing cars has been extremely heavy. Moreover, a third of a million freight cars now struggling to cope with record peacetime freight tonnage are more than 30 years old and another quarter of a million are 26 to 30 years old. All these are past normal retirement age.

"A new steel strike would cripple all efforts to meet the huge replacement needs of the railroads," Mr. Felton continued. "For example, during the steel and coal strikes in the spring of 1946 it was estimated that 12,000,000 tons of steel production was lost. Less than 10 per cent of that amount would enable the car builders to complete quickly all of the freight cars currently on order."

Recalling the swift crippling of industry by the brief freight embargo during the recent coal strike, Mr. Felton said that "a shutdown of the steel industry would have equally serious effects and of longer duration, for time lost in the production of urgently needed transportation equipment cannot be made up."

CHESAPEAKE & OHIO and the **NEW YORK, CHICAGO & ST. LOUIS** are jointly inquiring for 2,600 steel freight cars, of which 1,000 70-ton hopper cars will be equipped with roller bearings. Included in the inquiry are 1,600 50-ton box cars, 1,000 of which are for the C. & O. and 600 for the Nickel Plate.

SIGNALING

The **DULUTH, MISSABE & IRON RANGE** has placed an order with Railway Radio Telephone & Signals, Inc., for Aireon inductive train communication equipment, including 27 mobile and 10 wayside units, to be installed by railroad forces on the Missabe division, starting about January 15.

The **ST. LOUIS, BROWNsville & MEXICO**, part of the Missouri Pacific Lines, has ordered equipment from the General Railway Signal Company for the installation of a Type-F, 3-wire, centralized traffic control system on 26 miles of single track between Edmonds, Tex., and BM Siding. The control machine will be located at Angleton, 21 miles from the most distant controlled point. It will have 24 track-indication lights and 19 levers for the control of 34 signals, 8 switch machines, and an electric switch lock. Model-9A switch locks, Model-5D dual-control switch machines, Type-D and G signals, and Type-K relays are included in this order.

KATY'S HISTORY IN PREPARATION.—The Missouri-Kansas-Texas has commissioned W. A. S. Douglas, columnist and war correspondent for the Chicago Sun, to write a book delineating the history of that road and the territory it serves. It is scheduled for 1947 publication, according to the Katy Employees' Magazine.

yet...

★ Average Train Speeds Increased

★ Cost Per Ton-Mile Came Down

...when the Denver and Salt Lake installed G-R-S Centralized Traffic Control

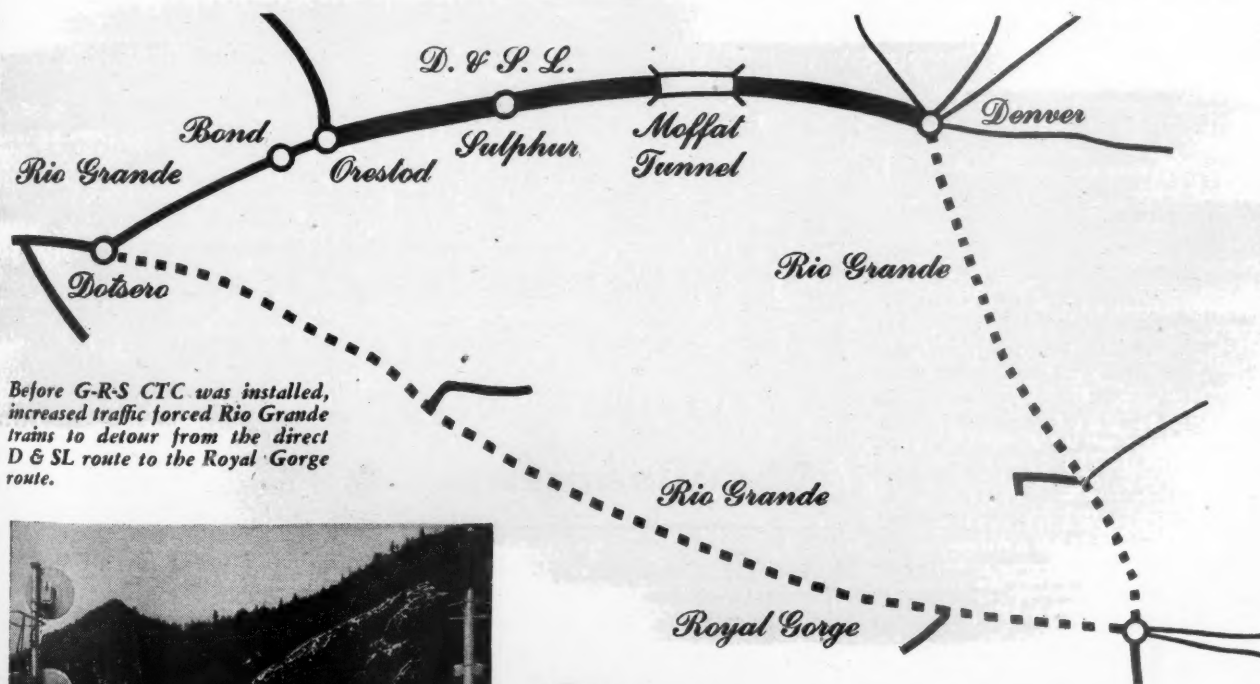
On the 128-mile stretch of the D & SL that cuts a direct route through the Rockies, linking the Rio Grande between Denver and Orestod, G-R-S Centralized Traffic Control licked a seemingly impossible traffic problem.

BEFORE the installation of CTC, increasing traffic had brought about a sharp decline in efficiency. As daily train movements jumped from 21.6 to 33.5, gross ton-miles per train-hour dipped 17 per cent, and average train speeds fell 20 per cent. The increasing traffic finally overloaded the line, forcing many Rio Grande trains to detour via the Royal Gorge Route.

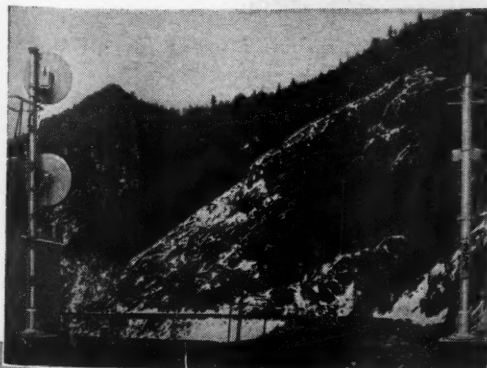
AFTER installation of G-R-S CTC, not only were detours eliminated—but the D & SL was able to handle an increase in traffic of 214 per cent! In addition, this change from train orders to operation on signal indication stepped up average train speeds. The installation has made possible more non-stop meets. It has increased the productivity of cars and motive power. It has produced important savings in fuel, supervisory costs, wear and tear, and other expenses.*

G-R-S CTC pays for itself quickly. Our nearest district office will be glad to cooperate with you in determining *in advance*, where and how you can use CTC to advantage. Simply phone or write today.

*For further information, see Railway Signaling, March, 1946



Before G-R-S CTC was installed, increased traffic forced Rio Grande trains to detour from the direct D & SL route to the Royal Gorge route.



CTC has stepped up average train speeds on the D & SL.

General
Railway Signal Company

ROCHESTER 2, N. Y. • NEW YORK 17 • CHICAGO 3 • ST. LOUIS 1

A-2127

Financial

CENTRAL OF GEORGIA.—Reorganization Expenses.—The Interstate Commerce Commission has denied a petition filed with it by the Central Hanover Bank & Trust Co., trustee, and Rathbone, Perry, Kelly & Drye, its counsel, for reconsideration and modification of the September 12 order of the commission's Division 4 which fixed the maximum limits of final allowance to be paid out as compensation for services and expenses in connection with this road's reorganization proceedings from June 19, 1940, to December 7, 1945. As noted in *Railway Age*, September 28, page 540, Rathbone, Perry, Kelly & Drye was allowed \$22,511 on a claim of \$50,011 as counsel for the trustee under three mortgage indentures.

CHICAGO, ROCK ISLAND & PACIFIC.—Reorganization.—Division 4 of the Interstate Commerce Commission has canceled the further hearing which was to have been held January 7 in connection with this road's plan of reorganization under Section 77 of the Bankruptcy Act. The hearing, originally scheduled for September 24, 1946, and twice postponed, was to have been held for the purpose of receiving evidence with respect to matters requiring further consideration pursuant to the order of the District Court of the United States for the Northern District of Illinois, Eastern Division, which referred back to the commission the plan of reorganization previously approved by it (see *Railway Age* of July 6, 1946, page 19). The commission's order canceling the January 7 hearing noted that this court action has been appealed, and the appeals "cannot be determined prior to January 7." It added that the hearing would be reassigned "if a hearing is necessary."

GULF, MOBILE & OHIO.—Equipment Trust Certificates.—Division 4 of the Interstate Commerce Commission has authorized this road to assume liability for \$3,600,000 of Series D equipment trust certificates, the proceeds of which will be applied toward the purchase price of equipment, estimated to cost \$4,592,410, as outlined in *Railway Age*, November 30, page 940. The certificates will mature in 12 equal annual installments starting January 1, 1948. The report also approves a selling price of 99.2599, based on a 2 per cent dividend rate, the bid of Halsey, Stuart & Co., and 13 associates, on which basis the average annual cost will be approximately 2.13 per cent.

MISSOURI-KANSAS-TEXAS.—Promissory Notes.—Division 4 of the Interstate Commerce Commission has authorized this road to issue at par not exceeding \$1,382,255 of promissory notes to further evidence the indebtedness it will assume under conditional sales agreements for the purchase of 100 70-ton all-steel covered hoppers and 10 Diesel-electric locomotives, as outlined in *Railway Age*, November 30, page 940. The commission's order stipulated that the notes shall bear interest at the rate of

1.92 per cent annually, the bid of the Manufacturers & Traders Trust Co., Buffalo, N. Y., which had been accepted subject to commission approval.

TOLEDO, PEORIA & WESTERN.—Note.—This road has applied to the Interstate Commerce Commission for authority to issue a \$300,000 2 per cent note, the proceeds of which will be applied toward working capital, which the applicant states it needs because of circumstances resulting from government seizure of its cash, other working capital, properties and assets on March 22, 1942.

Dividends Declared

Allegheny & Western.—6% guaranteed, \$3, semi-annually, payable January 1 to holders of record December 20.
Augusta & Savannah.—\$2.50, semi-annually, payable January 2 to holders of record December 19.
Carolina, Clinchfield & Ohio.—\$1.25, quarterly, payable January 20 to holders of record January 10.
Gulf, Mobile & Ohio.—\$5 preferred, \$2.50, payable January 17 to holders of record December 27.
Maine Central.—6% prior preferred, \$1.50, quarterly, payable January 2 to holders of record December 24.
Massachusetts Valley.—\$3, semi-annually, payable February 1 to holders of record December 31.
Mill Creek & Mine Hill Navigation.—\$1.25, semi-annually, payable January 9 to holders of record December 27.
Mount Carbon & Port Carbon.—\$1.25, semi-annually, payable January 9 to holders of record December 27.
New London Northern.—\$1.75, quarterly; extra, 50¢, both payable December 26 to holders of record December 14.
New York, Chicago & St. Louis.—6% preferred (accum.), \$5.00, payable January 10 to holders of record December 27.
Norfolk & Western.—adjustment preferred, \$1.00, quarterly, payable February 10 to holders of record January 15.
Northern Pacific.—\$1.00, payable February 1 to holders of record January 4.
Paterson & Hudson River.—\$1.38, payable January 15 to holders of record December 31.
Pere Marquette.—5% prior preferred (accum.), \$1.25, payable February 1 to holders of record January 7.
Piedmont & Northern.—extra, \$1.50, payable January 20 to holders of record January 6.
Reading.—25¢, quarterly, payable February 13 to holders of record January 16.
Savannah & Atlanta.—5% preferred, \$1.25, quarterly, payable January 1 to holders of record December 23.
Schuylkill Valley Navigation.—\$1.25, semi-annually, payable January 9 to holders of record December 27.
Tunnel of St. Louis.—\$3, semi-annually, payable December 23 to holders of record December 14.

Abandonments

ATLANTIC COAST LINE-LOUISVILLE & NASHVILLE.—These roads have applied to the Interstate Commerce Commission for authority to abandon operation over approximately 1.5 miles of the Lexington Terminal near Crawford, Ga. The latter road also seeks commission authority to abandon the segment.

ILLINOIS TERMINAL.—Division 4 of the Interstate Commerce Commission has authorized this road to abandon a portion of its so-called Tilton branch, extending approximately 1.6 miles from Danville, Ill., to Tilton. The usual employee-protection conditions were imposed.

RIO GRANDE & EAGLE PASS.—Division 4 of the Interstate Commerce Commission

has authorized this road to abandon its entire 7-mile line, extending from Laredo, Texas, to Farias. At the same time, the commission authorized the International-Great Northern, a constituent of the Missouri Pacific lines, to acquire the properties to be abandoned.

ST. LOUIS & OHIO RIVER.—Division 4 of the Interstate Commerce Commission has authorized this road to abandon a 4.3-mile portion of its line from Reeb Station, Ill., to the end of the line. The segment has not been operated for more than 10 years.

UTAH IDAHO CENTRAL.—This electric road has applied to the Interstate Commerce Commission for authority to abandon, including the operation thereof, its entire 114.7-mile line, including the main segments from Preston, Utah, to Ogden, and two branch lines from Harrisville, Utah, to Warren, and from Lewiston, Utah, to Thain. The applicant said it has been operating at a loss since 1943 and that there is no prospect that it can obtain sufficient added revenues to meet its operating charges, taxes and other costs.

Railway Officers

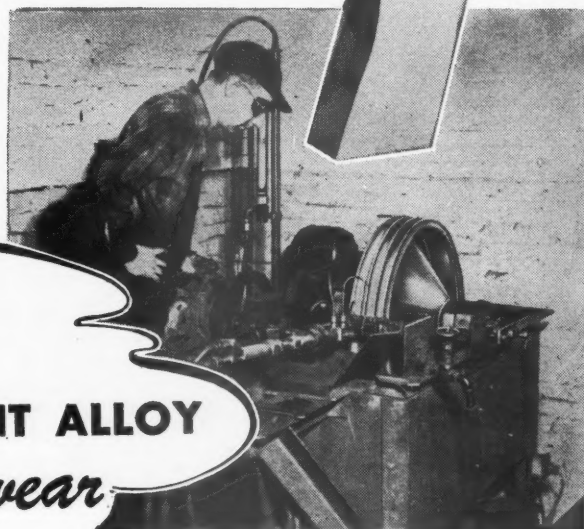
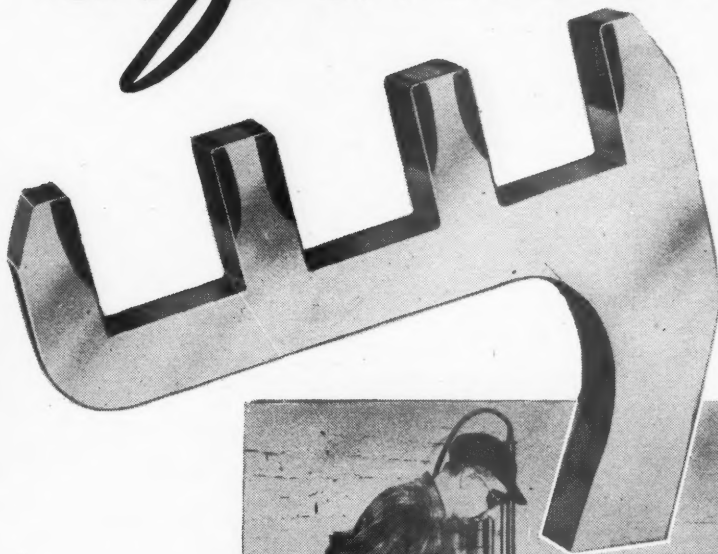
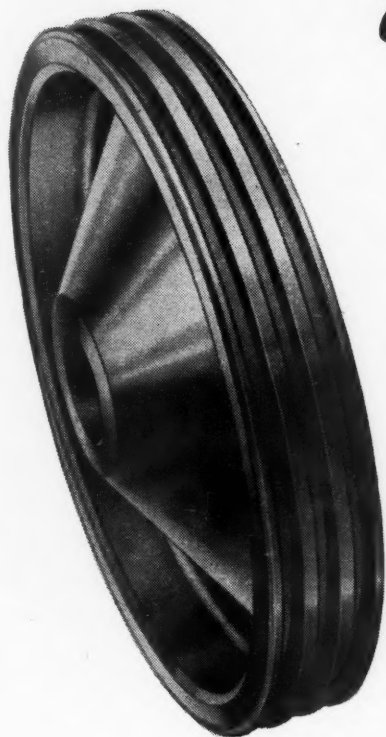
EXECUTIVE

F. P. Sisson, engineering assistant to the vice-president and general manager of the Grand Trunk Western, at Detroit, Mich., has retired after 47 years of service.

C. A. Lahey, vice-president of the Quaker Oats Company, Chicago, was elected chairman of the board of directors, Litchfield & Madison, at a board meeting in Chicago on December 16. Mr. Lahey succeeds **W. M. Duncan**.

Charles B. Whitlow, whose promotion to assistant to the president of the Gulf, Mobile & Ohio, with headquarters at Jackson, Tenn., was reported in the *Railway Age* of December 28, was born on September 4, 1906, at Jackson, and received his higher education at Union University. Mr. Whitlow began his railroad career with the Gulf, Mobile & Northern (now G. M. & O.) in 1928 as a clerk in the freight traffic department at Mobile, Ala. He also served in that capacity in the passenger department, and the following year became secretary to general counsel. In 1930 he was appointed secretary to development director at Jackson, Miss., and in 1931 became secretary and chief clerk to district freight agent at Jackson, Tenn. Mr. Whitlow was advanced to secretary to the president in 1932, which position he held until 1940 when he was promoted to executive assistant. Following duty with the Navy from 1943 to 1945, he returned to the G. M. & O. as executive assistant. He held this position at the time of his recent promotion.

FOR Perfect Piston Performance



**FLAME-HARDENED
HUNT-SPILLER LIGHTWEIGHT ALLOY
STEEL PISTONS *resist wear*
AT VITAL POINTS**

THE above cross section is retouched to show areas hardened by the operation pictured below it. This controlled operation enormously increases piston and bushing life by imparting superior wear resistance to parts where it is most needed—the edges of the ring grooves.

Hunt-Spiller Light Weight Alloy Steel Pistons are available in two and three-groove

types for either plain or lock-lip packing. For the utmost in service you will want to use them with genuine Hunt-Spiller packing rings of the type you prefer—gun iron, combination gun iron and bronze, and all-bronze.

HUNT-SPILLER MFG. CORPORATION
383 Dorchester Ave. Boston 27, Mass.

HUNT-SPILLER

**LIGHT WEIGHT
STEEL PISTONS AND VALVES
DUPLEX SECTIONAL PACKING
AIR FURNACE GUN IRON**

FINANCIAL, LEGAL AND ACCOUNTING

A. M. Jacobs, assistant treasurer of the Missouri-Kansas-Texas has been elected treasurer with headquarters as before at St. Louis, Mo., succeeding **T. H. Simpson**, who has retired after more than 51 years of service. **K. O. Jansson**, chief clerk of disbursements, has been elected assistant treasurer, succeeding Mr. Jacobs.

Thomas Gulston Watson, tax commissioner of the Canadian National, with headquarters at Montreal, Que., has retired after 39 years of service. Mr. Watson was born in London, England, in 1883 and received his education at St. Mark's College, London, and the City of London College. He commenced his railway career as assistant to the rating surveyor of the Great Northern of England. Going to Canada in 1908, he joined the Canadian Northern (now Canadian National) at Toronto, Ont., as assistant to the tax commissioner, and became tax commissioner in 1914. Soon after the amalgamation of the Canadian National in 1923, Mr. Watson was transferred to Montreal, continuing as tax commissioner.

George A. W. Achenbach, secretary of the Erie, with headquarters at Cleveland, Ohio, has retired under the pension rules of the company. Mr. Achenbach was born at Salisbury, N. C., on December 25, 1881, and received his LL. B. degree from New York University Law School in 1907. He entered railroad service on December 1, 1909, as district land and tax agent for the Erie, subsequently serving as assistant tax agent, managing clerk in the legal department and assistant to vice-president and general solicitor. From May 1, 1918, to March 31, 1920, Mr. Achenbach served as secretary, treasurer and counsel for SKF Industries. From April 1, 1920, to April 30, 1937, he was assistant to vice-president and secretary and assistant secretary of the Erie and from May 1, 1937, to November 30, 1938, he served as assistant secretary. He became secretary on December 1, 1938, which position he held until his retirement.

Herbert L. Hanson, assistant general claims attorney of the New York Central system, has been promoted to general claims attorney, with headquarters as before at New York, succeeding **Oliver G. Browne**, who has retired from active duty under the company's pension system. Mr. Hanson was born at Elkhart, Ind., on November 15, 1889, and received the LL. B. degree from Valparaiso University in 1912. He entered railroad service during summer vacations while attending college as a clerk in the shop accountant's office of the Lake Shore & Michigan Southern (now New York Central), at Cleveland, Ohio, and served as claim agent at Chicago, Paris, Ill., and Toledo, Ohio, successively. On June 16, 1917, Mr. Hanson was appointed district claim agent of the New York Central at Bellefontaine, Ohio, subsequently transferring to Columbus, Ohio and Toledo. On November 15, 1929, he became assistant chief claim agent of the system at New York and on December 1,

1937, he was appointed chief claim agent of the system. On August 1, 1945, Mr. Hanson became assistant general claims attorney at New York, which position he held until his recent promotion.

Mr. Browne was born at Livingston, N. Y., on May 28, 1876, and received his LL. B. from New York University Law School in 1902. He was admitted to the New York State Bar in October, 1902. Mr. Browne entered railroad service on June 1, 1893, as telegraph operator for the Central New England (now New York, New Haven & Hartford) at Copake, N. Y., and became agent and train dispatcher for the Poughkeepsie & Eastern (now also New Haven) at Poughkeepsie, N. Y., in February, 1895. In June, 1897, Mr. Browne was appointed telegraph operator for the West Shore, becoming claim agent for the New York Central at Albany, N. Y., on December 23, 1903; district claim agent at Watertown, N. Y., on November 1, 1910; assistant chief claim agent at New York on October 1, 1915, and claims attorney at New York on January 1, 1922. Mr. Browne was appointed general claims attorney on December 1, 1937, which position he held until his retirement.

OPERATING

H. A. Hudwalker has been appointed superintendent of the Pullman Company, at Cincinnati, Ohio.

Clement O. Johnson has been appointed superintendent of fuel and water service for the Seaboard Air Line, with headquarters at Jacksonville, Fla., a newly-created position.

G. B. Henderson, assistant general manager of the Chicago & Eastern Illinois, with headquarters at Chicago, has been promoted to general manager, with the same headquarters, succeeding **F. G. Nicholson**, who has retired after 42 years of service with the road.

F. MacPhillamy has been appointed superintendent of power of the New York Central system, with headquarters at New York, succeeding **A. D. Gilmore**, who has retired under the pension regulations of the company after more than 40 years of service.

L. M. Olson, superintendent of the Panhandle & Santa Fe (part of the Atchison, Topeka & Santa Fe system), at Slaton, Tex., has been transferred to the Eastern division of the A. T. & S. F., at Emporia, Kan., succeeding **J. N. Landreth**, acting superintendent there, who has returned to his former duties as trainmaster.

J. F. Alsip, assistant general manager of the Northern Pacific, at Seattle, Wash., has been promoted to general manager there, succeeding **F. R. Bartles**, who has retired after 49 years of railway service. **C. H. Burgess**, superintendent of the Tacoma division, at Tacoma, Wash., has been advanced to assistant general manager, replacing Mr. Alsip, and **I. P. Iversen**, assistant superintendent, at Seattle, relieves Mr. Burgess. Mr. Iversen, is succeeded as

assistant superintendent by **F. W. McCabe**, trainmaster at Seattle.

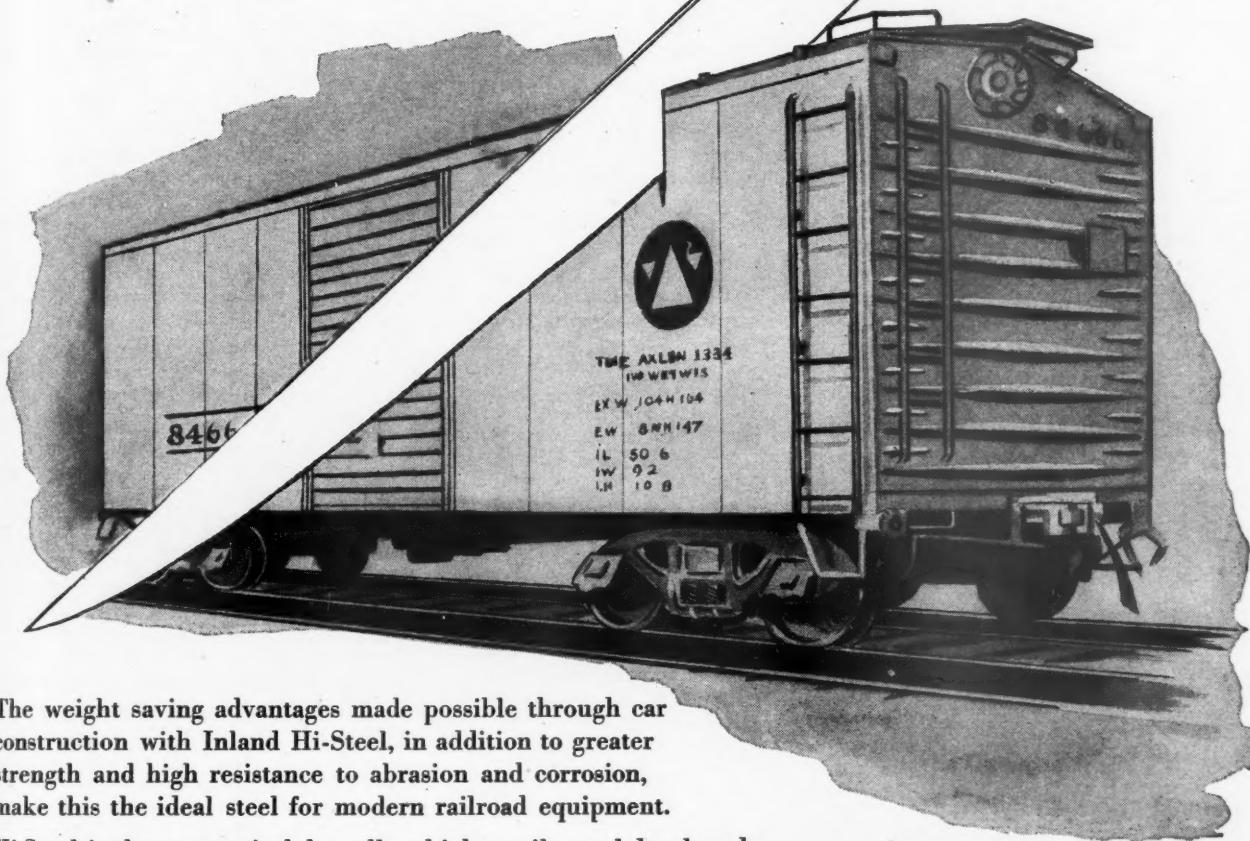
Guy Prentiss Gibbs, assistant general superintendent of the Chesapeake & Ohio, with headquarters at Huntington, W. Va., has been promoted to general superintendent of the Western general division, with the same headquarters, succeeding **C. A. Taylor**, whose promotion to general manager at Richmond, Va., was reported in the *Railway Age* of December 21. **Colonel S. H. Pulliam**, assistant superintendent at Huntington, has been promoted to superintendent of the Huntington division, succeeding **H. E. Webb**, who has been assigned to other duties.

W. B. Simmons, superintendent of terminals of the Chicago, Burlington & Quincy, at St. Louis, Mo., has been promoted to assistant general superintendent of transportation, with headquarters at Chicago. **C. L. Gray**, office manager to the superintendent of transportation, at Chicago, has been advanced to assistant superintendent of transportation there. These are both new positions. **A. F. McKelvie**, superintendent at Centerville, Ia., has been appointed superintendent of terminals at St. Louis, succeeding Mr. Simmons. **E. P. Stine**, superintendent of terminals of the Burlington and the Colorado & Southern, at Denver, Colo., has been appointed superintendent of the Ottumwa-Creston division of the Burlington, at Ottumwa, Ia., succeeding **C. J. Connnett**, who has retired, and **J. J. Ryan**, assistant superintendent at Lincoln, Neb., has been promoted to superintendent of terminals at Denver, replacing Mr. Stine. **G. B. Andress**, trainmaster at Alliance, Neb., has been advanced to assistant superintendent at Sterling, Colo., succeeding **E. R. Shrader**, who has been transferred to Lincoln, relieving Mr. Ryan. **C. R. Phillips** has been appointed trainmaster at Alliance replacing Mr. Andress.

J. B. Delaney, superintendent of the Pennsylvania division of the New York Central, with headquarters at Jersey Shore, Pa., has been transferred to the Syracuse division, with headquarters at Syracuse, N. Y., succeeding **P. C. Agans**, who has retired after more than 45 years of service with that road. **H. B. Tucker**, superintendent of the Rochester division at Rochester, N. Y., has been transferred to the Pennsylvania division at Jersey Shore, to succeed Mr. Delaney. **H. G. Farnham**, assistant superintendent of the River division, with headquarters at Weehawken, N. J., has been promoted to superintendent of the Rochester division at Rochester, N. Y., succeeding Mr. Tucker. **S. H. Keyes** has been appointed assistant superintendent of the River division at Weehawken, succeeding Mr. Farnham. **W. A. Shea** has been appointed trainmaster of the Buffalo division at Buffalo, N. Y., and **H. F. Neville** has been appointed trainmaster of the Pennsylvania division at Jersey Shore. **N. W. Watson** has been appointed trainmaster of the St. Lawrence, Ottawa and Adirondack divisions, with headquarters at Watertown, N. Y. **R. J. Dorey** has been appointed train-

Cut car weight

3 to 5 Tons with Inland Hi-Steel



The weight saving advantages made possible through car construction with Inland Hi-Steel, in addition to greater strength and high resistance to abrasion and corrosion, make this the ideal steel for modern railroad equipment.

Hi-Steel is the economical, low alloy, high tensile steel developed by Inland that has made possible weight reductions of 3 to 5 tons in standard box or hopper cars and yet maintain a full margin of strength and safety.

In comparison with ordinary structural grade carbon steel it has a yield nearly twice as great with a fatigue strength approximately 1/3 greater. A simple heat treatment will give even greater strength to meet particular applications.

Tests prove Hi-Steel will resist corrosion four to six times longer than ordinary steels . . . has a high resistance to abrasion.

Nearly all forms are rolled in Inland Hi-Steel, and our engineering staff is ready to advise you in adapting this superior steel to your individual requirements. Write for a copy of the Inland Hi-Steel Booklet.



Inland 4-Way Floor Plate adds structural strength—improves safety when installed for passenger car platforms and steps.



INLAND STEEL COMPANY, 38 South Dearborn Street, Chicago 3, Illinois
Sales Offices: Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul

More scrap means more steel — return yours promptly

Other Products Include: PLATES • SHEETS • STRIP • TIN PLATE • PILING • REINFORCEMENT BARS • RAILS • TRACK ACCESSORIES

January 4, 1947

153

master of the St. Lawrence, Ottawa and Adirondack divisions at Watertown.

Mr. Agans was born at Syracuse, N. Y., on May 16, 1877, and entered railroad service on August 21, 1894, as towerman in the transportation department of the New York Central. He served in that capacity until March 31, 1905, when he became assistant train dispatcher at Albany, N. Y. Mr. Agans was appointed dispatcher at Albany on December 10, 1905, chief signalman of the Mohawk division on October 24, 1918, and trainmaster at Albany on July 27, 1920. He became assistant superintendent at Albany on January 1, 1930, and was promoted to superintendent of the Rochester division on November 1, 1937. Mr. Agans was transferred to the Syracuse division in June 1940, where he remained until his retirement.

R. C. Canady, assistant division superintendent of the St. Louis-San Francisco, with headquarters at Tulsa, Okla., has been promoted to superintendent of the Western division, with headquarters at Enid, Okla. He succeeds **C. K. Sims**, who has been transferred to Fort Scott, Kan., where he replaces **Hugh R. Wade**, who has retired after 36 years of service.

Mr. Wade was born on December 20, 1881, at Bradonville, W. Va., and began his railroad career with the West Virginia & Pittsburgh (now Baltimore & Ohio) as agent and operator. He served in that capacity successively with the Kana-waha & Michigan (part of the New York Central System), the B. & O., and the Pittsburgh & Lake Erie (part of the N. Y. C.). Later Mr. Wade was train dispatcher successively on the following roads: Pittsburg, Shawmut & Northern; Louisville & Nashville; Cleveland, Cincinnati, Chicago & St. Louis (part of the N. Y. C.); Atchison, Topeka & Santa Fe; and the Missouri Pacific. In 1910 he became a train dispatcher on the Frisco, and advanced through the positions of trainmaster and assistant superintendent to that of superintendent, which position he held at the time of his retirement.

TRAFFIC

Edwin T. Reynolds, freight traffic manager of the Pere Marquette, with headquarters at Detroit, Mich., has retired.

John A. Proctor, assistant general freight agent of the Rutland, with headquarters at Rutland, Vt., has retired after 61 years of service with that road.

W. H. Wharton, general freight agent, service and sales, of the Nashville, Chattanooga & St. Louis, has retired after 48 years of service.

George F. Wynn, general agent, freight traffic, of the New York Central, at Chicago, has retired after nearly 55 years of continuous service.

R. E. Schaffert, district passenger agent of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Tacoma, Wash., has been promoted to assistant general agent, passenger department, with headquarters at Seattle, Wash. He is suc-

ceeded by **M. P. Burns**, city passenger agent at Butte, Mont. **J. K. Pain**, district passenger agent at Portland, Ore., has been transferred to Seattle, Wash., where he succeeds **A. J. McCarthy**, who has retired after more than 38 years of service with the road. Mr. Pain is succeeded at Portland by **George V. Valley**.

G. W. Killum has been appointed general agent of the Chicago, St. Paul, Minneapolis & Omaha (part of the Chicago & Northwestern system), with headquarters at Vancouver, B. C.

C. M. Lightburn, assistant to chief engineer of the Denver & Rio Grande Western, with headquarters at Denver, Colo., has been appointed industrial engineer, with the same headquarters.

C. L. Rich has been appointed division passenger agent of the Gulf, Colorado & Santa Fe, part of the Atchison, Topeka & Santa Fe system, with headquarters at Dallas, Tex., succeeding **Roy R. Hunley**, deceased.

R. E. Irons, general agent of the Chicago, Indianapolis & Louisville, at Winston-Salem, N. C., has been transferred to Minneapolis, Minn. **Gilbert L. Harris**, traveling freight agent at Detroit, has been promoted to general agent at Winston-Salem, succeeding Mr. Irons.

Paul H. Swinney, traveling passenger agent of the Gulf, Colorado & Santa Fe (part of the Atchison, Topeka & Santa Fe), at Houston, Tex., has been promoted to division passenger agent there, succeeding **L. V. Polk**, who has retired after 35 years of railroad service.

ENGINEERING & SIGNALING

A. T. Hawk, engineer architect of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has retired after 46 years of railroad service.

Col. Howard M. Smitten, bridge engineer of the Western Pacific, at San Francisco, Cal., has retired after 40 years of railroad service, of which 25 have been with the W. P.

C. B. Cargile, acting superintendent of telegraph and signals of the Florida East Coast, at St. Augustine, Fla., has been appointed superintendent of communications and signals, with the same headquarters, succeeding **W. A. Hoffman**, who has resigned and is now serving in the communications division, department of transportation, of the U. S. military government, at Seoul, Korea. Coincident with this appointment, the name of the telegraph and signal department has been changed to the communications and signal department.

C. T. Gunsallus, division engineer of the New York Central lines Buffalo and east, with headquarters at Watertown, N. Y., has been appointed district engineer of the Boston & Albany, with headquarters at Boston, Mass., succeeding **L. G. Morphy**, who has retired under the pension regulations of the company, after more than 46 years of service. **E. R.**

Murphy, assistant division engineer of the Electric division, with headquarters at New York, has been promoted to division engineer of the St. Lawrence, Adirondack and Ottawa divisions, with headquarters at Watertown, N. Y.

Luis G. Morphy was born at Orizaba, Vera Cruz, Mexico, on December 4, 1876, and received his A.B. degree from Spring Hill College, Mobile, Ala., and his B.S. degree from Rensselaer Polytechnic Institute, Troy, N. Y., in 1897. He entered railroad service in 1900 as transitman for the New York Central, subsequently serving with that road as supervisor of track, assistant engineer, resident engineer and assistant to principal assistant engineer. He was appointed assistant engineer maintenance of way and construction of the Boston & Albany in 1907, then serving as assistant to chief engineer, designing and division engineer and principal assistant engineer for that road. From 1920 to 1921 Mr. Morphy was manager in South America for the Foundation Company of New York. In 1921 he went with the Rutland as chief engineer, becoming general superintendent and chief engineer in 1926; general manager and chief engineer in 1937, and receiver of the Rutland in 1938. Mr. Morphy served in the latter capacity until 1941, when he became district engineer of the Boston & Albany at Boston, which position he held until his retirement.

Anton Anderson, whose retirement as chief engineer of the Chicago, Indianapolis & Louisville, with headquarters at Lafayette, Ind., was reported in the *Railway Age* of November 9, was born at Lafayette on October 12, 1879, and was graduated by Purdue university in 1901 with the degree of B. S. in civil engineering. He entered railroad service in 1902 on the Choctaw, Oklahoma & Gulf (now Chicago, Rock Island & Pacific). In 1903 he served with the Indianapolis Northern Traction Company on traction line construction; in 1904, as a draftsman on the Midland Valley; and from 1904 to 1906 as city engi-



Anton Anderson

neer at Lafayette. Mr. Anderson entered the service of the Chicago, Indianapolis & Louisville in March, 1906, as a resident engineer and engineer of construction. From 1908 to 1918 he served as assistant engineer and as division engineer, at Chicago, and from October, 1918, to February,



Time out to say— “THANK YOU”

The Hyatt organization, at the beginning of its fifty-fifth year, takes time out to say “Thank you.”

To the many design-engineers and industrial leaders of America who have cooperated with Hyatt in fighting friction, we express our sincere appreciation.

The splendid team spirit which prevails between Hyatt and the users of Hyatt Roller Bearing products is an asset of high value.

Much has been accomplished toward substantially increasing Hyatt's production capacity. In addition to our wartime expansion at Harrison, New Jersey, another plant in nearby Clark Town-

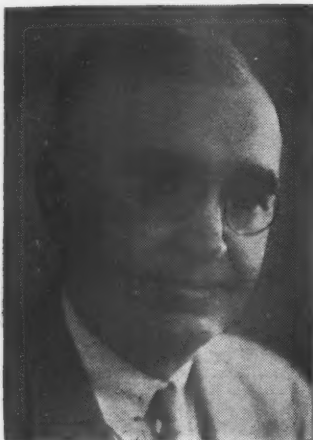
ship is now fully engaged in the production of Hyatt Roller Bearings and Hyatt Roller Bearing Railroad Journal Boxes.

Entering 1947 we again make a promise—which we have adhered to for the fifty-four preceding years — Hyatt Roller Bearings will embody every improvement in design and material to meet tomorrow's requirements. We shall continue to deliver roller bearings which will assure the longest trouble-free performance to the buyer. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.; Chicago, Detroit, Pittsburgh, Oakland, California.

HYATT ROLLER BEARINGS

1920, he served as principal assistant engineer, valuation engineer, and corporate engineer. In February, 1920, he was appointed engineer maintenance of way, at Lafayette, and served in that capacity until February, 1938, when he became chief engineer, with the same headquarters. On February 22, 1941, Mr. Anderson was also appointed assistant chief operating officer.

W. F. Zane, signal engineer of the Chicago, Burlington & Quincy, at Chicago, has been appointed chief signal engineer, system, with the same headquarters, and



W. F. Zane

A. L. Essman, principal assistant signal engineer, at Chicago, has been advanced to signal engineer, system, succeeding Mr. Zane. **T. W. Tizzard**, office engineer in the office of the signal engineer, at Chicago, has been appointed principal assistant signal engineer, system.

Mr. Zane was born at Odebolt, Iowa, on October 1, 1882, and received his higher technical training at Highland Park College, Des Moines, Iowa. He entered railroad service on September 16, 1903, as a rodman on the Burlington. He served as a draftsman in the signal department from 1906 to 1911, and as signal inspector from 1911 to June 1, 1916, when he became assistant signal engineer. On July



A. L. Essman

20, 1926, Mr. Zane was advanced to signal engineer, at Chicago, the position he held at the time of his recent promotion.

Mr. Essman was born at St. Joseph, Mo.,

on September 20, 1906, and entered the service of the Burlington on March 24, 1926, as an assistant signalman on system signal construction. He was promoted to signalman on June 1, 1926, and served as a draftsman in the signal engineer's office from January 24, 1928, to March 1, 1937. On the latter date Mr. Essman was appointed junior signal inspector. He became signal supervisor on October 1, 1938, and assistant to signal engineer on September 1, 1939. On May 15, 1941, he was advanced to principal assistant signal engineer, at Chicago, which position he held at the time of his recent promotion.

MECHANICAL

H. R. Friel, **F. E. Hesford**, **H. Liebert**, and **H. G. Schaffner** have been appointed Diesel locomotive inspectors for the New York Central system, all with headquarters at New York.

George E. Bennett, whose promotion to superintendent of motive power of the Chicago & Eastern Illinois, with headquarters at Danville, Ill., was reported in the *Railway Age* of December 14, was born on September 9, 1904, at Flandreau, S. D., and entered railroad service with the C. & E. I. in 1922 as a machinist helper at Danville. Mr. Bennett was ad-



George E. Bennett

vanced to machinist in 1924 and to assistant roundhouse foreman in 1937. He served as night roundhouse foreman at St. Louis, Mo., and Danville during 1938, and was appointed day roundhouse foreman in 1941. The following year he became foreman back shop at Danville, and in 1943 was promoted to shop superintendent. He was further advanced to master mechanic at Villa Grove, Ill., in 1945, which position he held at the time of his new appointment.

T. G. McFall has been appointed superintendent of machinery, with jurisdiction over the mechanical department, of the Clinchfield, with headquarters at Erwin, Tenn., succeeding **G. F. Schull**, who has retired.

A. J. Hartman, master mechanic of the Atchison, Topeka & Santa Fe, with headquarters at Albuquerque, N. M., has been promoted to mechanical superintendent, with headquarters at Amarillo, Tex.

He succeeds **W. R. Harrison**, who has retired after more than 45 years of service. Mr. Hartman is succeeded by **H. E. Anderson**, master mechanic at Slaton, Tex., who in turn is succeeded by **John Fertig**.

PURCHASES AND STORES

L. F. Spencer, acting purchasing agent of the New York, Susquehanna & Western, with headquarters at Paterson, N. J., has been appointed purchasing agent.

The title of **O. H. Nance**, president and general manager of the Maryland & Pennsylvania, with headquarters at Baltimore, Md., has been changed to president at his own request. **J. B. Nance**, superintendent, has been elected to the newly-created position of vice-president and general manager. The position of superintendent has been abolished.

E. F. DeLisle, assistant general storekeeper of the New York Central system, with headquarters at West Albany, N. Y., has been promoted to general storekeeper with the same headquarters, succeeding **B. W. Griffith**, who has retired under the pension regulations of the company, after nearly 39 years of service. **J. H. Carney**, district storekeeper at Utica, N. Y., has been appointed assistant general storekeeper at West Albany, succeeding Mr. DeLisle.

SPECIAL

Donald E. Mumford has been appointed superintendent of safety of the New York Central system, with headquarters at New York. **Charles E. Bell** has been appointed assistant to superintendent of safety at New York.

OBITUARY

L. P. Michael, who retired on April 21, 1944, as chief mechanical engineer of the Chicago & North Western, died at Phoenix, Ariz., on December 18.

Arthur Rodgers Wood, auditor-treasurer of the St. Louis Southwestern of Texas, with headquarters at Tyler, Tex., whose death was reported in the *Railway Age* of December 28, was born on October 23, 1874, at Decatur, Ill., and entered railroad service with the road in 1892 as a messenger boy. Mr. Wood held various clerical positions until 1898, when he was advanced to chief clerk, ticket accounts. He served as general bookkeeper from 1901 to 1903, and from the latter year until 1909 was chief clerk, miscellaneous accounts. His subsequent career was as follows: 1909-1910, auditor, Gulf, Texas & Western (now St. Louis-San Francisco); 1910-1914, chief clerk to auditor, San Antonio & Aransas Pass (now Southern Pacific); 1914-1917, assistant auditor, S. A. & A. P., and 1917-1918, assistant auditor, St. L. S. W. of Texas. From 1918 to 1929 Mr. Wood served as auditor of the latter road, and in 1930 was made also treasurer. He was a director of the company, auditor-treasurer of the Southwestern Transportation Company (truck subsidiary of the line) and a director of a number of business firms in Tyler.

n, who has
s of service
H. E. An-
laton, Tex.
ohn Fertig
TORES
nasing agent
& Western
N. J., has
nt.
e, president
Maryland
rs at Balti-
o president
nce, super-
the newly-
sident and
n of super-

neral store-
tral system
any, N. Y.,
storekeeper,
succeeding
d under the
pany, after
H. Carney,
N. Y., has
storekeep-
g Mr. De-

en appoint-
the New
headquar-
ll has been
tendent of

d on April
engineer of
n, died at

ditor-treas-
western of
yler, Tex.,
e Railway
on October
tered rail-
1892 as a
ld various
en he was
accounts
from 1901
year until
neous ac-
as fol-
Texas &
rancisco);
San An-
Southern
auditor, S.
istant au-
from 1918
auditor of
made also
the com-
thwestern
subsidiary
number of



The Going's Getting Smoother...

It's our distinct pleasure to tell you that, after many long and tiresome years of waiting, the lumber situation is beginning to smooth out a bit. However, we don't want to build up false illusions or appear overly optimistic. The lumber shortage, although easing gradually, still exists. We're still unable to fill every order to completion. But, take heart! Each passing month finds us better able to aid you... and we hope the day won't be far off when we can again serve you promptly.

CAR DECKING
•
CAR SIDING
•
CAR ROOFING
•
CAR FRAMING
•
CAR LINING
•
CROSSING PLANK
•
TIMBERS
•
GENERAL
MAINTENANCE
LUMBER

Southern Pine Lumber Company

Mills: Diboll and Pineland, Texas
Sales Office: Texarkana, U. S. A.

drinks two quarts a day, so they take six quarts every day at 23 cents a quart, and that's more than \$30 a month. His wife gets by on her pre-war fur coat—"musk-rat, I think; can't remember exactly"—and George finds three suits and five pairs of shoes plenty.

Someone told George that Russian railroad engineers were expected to cover about 3,725 miles a month and got as high as \$750 for doing it. He's inclined to think that's "baloney."

"In the U. S., under the law, you can't work more than fifteen hours fifty-nine minutes out of twenty-four hours," he points out, "because they figure beyond that you're overtaxing a man's endurance, and they're right. To cover 3,725 miles you'd spend a hell of a lot more time than sixteen hours a day in the cab. Can't see it."

Yugoslavia—In the new Yugoslavia Ivan, a locomotive engineer since 1932, finds life easier than before the war.

Thirty-eight-year-old Ivan lives in a government-owned apartment building in the railroad workers' section of Belgrade. It occupies three rooms with a balcony and pantry.

In a backward country like Yugoslavia Ivan stands out. Not everyone can run an engine. He has been a railway worker since 1926, first as a roundhouse mechanic and now as an engineer on passenger trains. Life is difficult, but Ivan has his philosophy: "I like to eat and drink only the best. My children are entitled to the same, so we don't save any money."

His basic pay is \$76 a month. He gets \$40 for extra runs. The family spends about \$2 a day for food, which includes beef and horse meat, vegetables in season and fruit. The diet is not too well balanced. Fresh fruits and vegetables are hard to find in winter.

The family's rent is 360 dinars, about \$7.20, a month. That includes garbage disposal and chimney sweeping.

Ivan is a member in good standing in his union and is a committee member on the local council. His work is concerned with sanitation and clothes distribution. He likes visiting.

He used to drop in to the local bar, but "since my wife has equal rights I don't dare," he said.

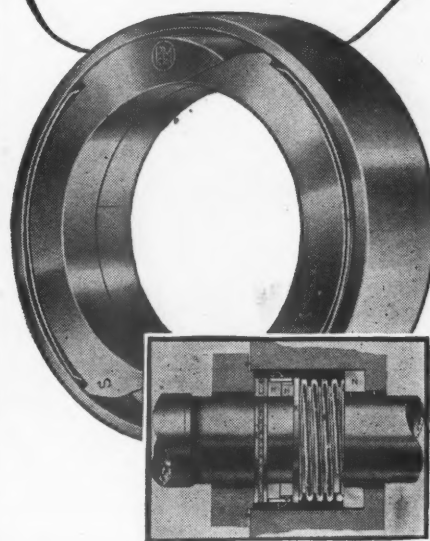
P. & D. Service Hearing Slated for Chicago February 18

Initial Interstate Commerce Commission hearings in the Nos. 29555 and MC-C-542 proceedings, pertaining to pick-up and delivery services by railroads and motor carriers, respectively, have been set for February 18, at the Hotel Sherman, Chicago, before Commissioner Rogers and Examiners Stiles and Aplin.

According to a commission notice, C. O. Fischer, chairman of the Connecticut Public Utilities Commission; H. P. Apperson of the Virginia State Corporation Commission, and K. D. Williams of the Missouri Public Service Commission, has been designated by the National Association of Railroad and Utilities Commissioners to sit in the hearings under the so-called co-operative plan.

Quality Proved

*in hundreds of
locomotives....
over millions of
miles traveled...*



Performance proves! In nearly fifty years of service to the steam power field, P-M Metallic Rod Packing has earned its position of leadership. Its star performance in packing steam pressures is reflected in the selection of materials and application of expert, painstaking craftsmanship in manufacture. Each segment bears the Paxton-Mitchell "P-M" trade-mark and is made of selected metals which withstand the extreme pressures of today's operating conditions. Special composition metal segments available for super-heated steam.

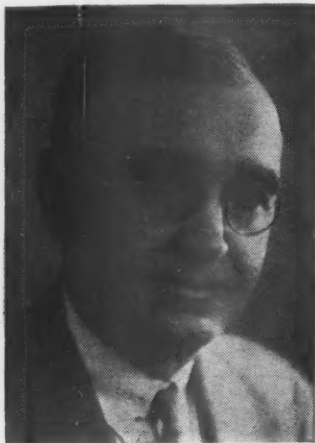
P-M Metallic Rod Packing

The Packing that Packs

Paxton-Mitchell Company
Engineers — Founders — Craftsmen
Omaha 5, Nebraska

1920, he served as principal assistant engineer, valuation engineer, and corporate engineer. In February, 1920, he was appointed engineer maintenance of way, at Lafayette, and served in that capacity until February, 1938, when he became chief engineer, with the same headquarters. On February 22, 1941, Mr. Anderson was also appointed assistant chief operating officer.

W. F. Zane, signal engineer of the Chicago, Burlington & Quincy, at Chicago, has been appointed chief signal engineer, system, with the same headquarters, and



W. F. Zane

A. L. Essman, principal assistant signal engineer, at Chicago, has been advanced to signal engineer, system, succeeding Mr. Zane. **T. W. Tizzard**, office engineer in the office of the signal engineer, at Chicago, has been appointed principal assistant signal engineer, system.

Mr. Zane was born at Odebolt, Iowa, on October 1, 1882, and received his higher technical training at Highland Park College, Des Moines, Iowa. He entered railroad service on September 16, 1903, as a rodman on the Burlington. He served as a draftsman in the signal department from 1906 to 1911, and as signal inspector from 1911 to June 1, 1916, when he became assistant signal engineer. On July



A. L. Essman

20, 1926, Mr. Zane was advanced to signal engineer, at Chicago, the position he held at the time of his recent promotion.

Mr. Essman was born at St. Joseph, Mo.,

on September 20, 1906, and entered the service of the Burlington on March 24, 1926, as an assistant signalman on system signal construction. He was promoted to signalman on June 1, 1926, and served as a draftsman in the signal engineer's office from January 24, 1928, to March 1, 1937. On the latter date Mr. Essman was appointed junior signal inspector. He became signal supervisor on October 1, 1938, and assistant to signal engineer on September 1, 1939. On May 15, 1941, he was advanced to principal assistant signal engineer, at Chicago, which position he held at the time of his recent promotion.

MECHANICAL

H. R. Friel, **F. E. Hesford**, **H. Liebert**, and **H. G. Schaffner** have been appointed Diesel locomotive inspectors for the New York Central system, all with headquarters at New York.

George E. Bennett, whose promotion to superintendent of motive power of the Chicago & Eastern Illinois, with headquarters at Danville, Ill., was reported in the *Railway Age* of December 14, was born on September 9, 1904, at Flandreau, S. D., and entered railroad service with the C. & E. I. in 1922 as a machinist helper at Danville. Mr. Bennett was ad-



George E. Bennett

vanced to machinist in 1924 and to assistant roundhouse foreman in 1937. He served as night roundhouse foreman at St. Louis, Mo., and Danville during 1938, and was appointed day roundhouse foreman in 1941. The following year he became foreman back shop at Danville, and in 1943 was promoted to shop superintendent. He was further advanced to master mechanic at Villa Grove, Ill., in 1945, which position he held at the time of his new appointment.

T. G. McFall has been appointed superintendent of machinery, with jurisdiction over the mechanical department, of the Clinchfield, with headquarters at Erwin, Tenn., succeeding **G. F. Schull**, who has retired.

A. J. Hartman, master mechanic of the Atchison, Topeka & Santa Fe, with headquarters at Albuquerque, N. M., has been promoted to mechanical superintendent, with headquarters at Amarillo, Tex.

He succeeds **W. R. Harrison**, who has retired after more than 45 years of service. Mr. Hartman is succeeded by **H. E. Anderson**, master mechanic at Slaton, Tex., who in turn is succeeded by **John Fertig**.

PURCHASES AND STORES

L. F. Spencer, acting purchasing agent of the New York, Susquehanna & Western with headquarters at Paterson, N. J., has been appointed purchasing agent.

The title of **O. H. Nance**, president and general manager of the Maryland & Pennsylvania, with headquarters at Baltimore, Md., has been changed to president at his own request. **J. B. Nance**, superintendent, has been elected to the newly created position of vice-president and general manager. The position of superintendent has been abolished.

E. F. DeLisle, assistant general storekeeper of the New York Central system with headquarters at West Albany, N. Y., has been promoted to general storekeeper with the same headquarters, succeeding **B. W. Griffith**, who has retired under the pension regulations of the company, after nearly 39 years of service. **J. H. Carnes**, district storekeeper at Utica, N. Y., has been appointed assistant general storekeeper at West Albany, succeeding Mr. DeLisle.

SPECIAL

Donald E. Mumford has been appointed superintendent of safety of the New York Central system, with headquarters at New York. **Charles E. Bell** has been appointed assistant to superintendent of safety at New York.

OBITUARY

L. P. Michael, who retired on April 21, 1944, as chief mechanical engineer of the Chicago & North Western, died at Phoenix, Ariz., on December 18.

Arthur Rodgers Wood, auditor-treasurer of the St. Louis Southwestern of Texas, with headquarters at Tyler, Tex., whose death was reported in the *Railway Age* of December 28, was born on October 23, 1874, at Decatur, Ill., and entered railroad service with the road in 1892 as a messenger boy. Mr. Wood held various clerical positions until 1898, when he was advanced to chief clerk, ticket accounts. He served as general bookkeeper from 1901 to 1903, and from the latter year until 1909 was chief clerk, miscellaneous accounts. His subsequent career was as follows: 1909-1910, auditor, Gulf, Texas & Western (now St. Louis-San Francisco); 1910-1914, chief clerk to auditor, San Antonio & Aransas Pass (now Southern Pacific); 1914-1917, assistant auditor, S. A. & A. P., and 1917-1918, assistant auditor, St. L. S. W. of Texas. From 1918 to 1929 Mr. Wood served as auditor of the latter road, and in 1930 was made also treasurer. He was a director of the company, auditor-treasurer of the Southwestern Transportation Company (truck subsidiary of the line) and a director of a number of business firms in Tyler.

n, who ha
s of service
H. E. An
slaton, Tex
ohn Fertig

TORES

hasing agen
& Western
, N. J., ha
nt.

e, presiden
Maryland &
rs at Balb
co presiden
nce, super
the newly
sident and
n of super

neral store
tral system
any, N. Y.
storekeeper
succeeding
d under the
pany, after
H. Carnes
N. Y., has
storekeeper
g Mr. De

en appoint
the New
headquarter
l has been
tendent of

on April
ngineer of
, died at

itor-treas
estern of
ler, Tex.
e Railway
n October
ered rail-
892 as a
l various
n he was
accounts
rom 1901
ear until
eous ac-
as fol-
Texas &
ancisco)
San An-
Southern
ditor, S.
stant au-
rom 1918
ditor of
made also
the com-
hwestern
bsidiary
umber of

y 4, 194

N

hours
cab to
have c
122 ki
work
averag
author
manag
tained
penalty
operati
When
along
railroa
sians t
east m
occasio
which
the ex

Here
which
social
nally
clothes
prospe
cottag
owned
tables,
Since
ing, h
of 112
hope
workin
troubl

Gre
Dunk
were
Georg
weeks
old. M
friars
ers bl

By
life, b
food
how p
and ex
He is
which
line f
locom
trains

For
the li
musta
blacke
He's
ular
means
two w

The
5s to
to \$27
any o
in a p
\$7.40
there
tions
ance,
a wee
Price
shoes

Railwa

OR

NEWS DEPARTMENT

Amazing Variations in Enginemen's Lot

(Continued from page 117)

hours straight with one other man in the cab to relieve him. After that shift they have equal time off. His longest run is 122 kilometers, or about 76 miles, so his work conditions are probably better than average. He says the Soviet occupation authorities recently restored more of the management to the Germans but have retained full disciplinary authority. The penalty for an accident or infraction of operational rules is a long visit to Siberia. When on duty he must bring his own food along as there is no provision for feeding railroad personnel. The fact that the Russians tore up trackage from Berlin to the east makes the entire line single track and occasions long delays and slow service, which in turn accounts in part at least, for the extraordinarily long shifts.

Hermann receives 412 marks a month, of which 263 is net, the rest going for taxes, social insurance, etc. [The mark is nominally about 10 cents.] He says his work clothes are all he has, and he has little prospect of getting more. He lives in his cottage and cultivates a small plot that is owned by the city of Berlin. He has vegetables, a few rabbits and a few chickens. Since there is no gas in his house for cooking, he has the relatively generous ration of 112 pounds of coal a month. He sees no hope for the future and is far too busy working and thinking of his personal troubles to give thought to politics.

Great Britain—In the dark days of Dunkerque when the beaten British troops were streaming back from the coast, George worked 18 to 20 hours a day for weeks on end, and he was then 58 years old. His train was the last off the Blackfriars bridge the night the German bombers blasted it down.

By most standards his has been a hard life, but all George would complain of was food and coal; how little he got to eat, how poor the canteens were and how hard and expensive it was to get coal and wood. He is what they call a top-line driver, which means he has gone steadily up the line from cleaner, fireman and ordinary locomotive engineer to engineer on the boat trains, including the "Golden Arrow."

For 46 years this has been going on for the little old man with the drooping gray mustache, sharp nose, bright eyes and the blackened hands of the railway workman. He's going as hard as ever, six days' regular work and alternate Sundays, which means that he gets only one day off every two weeks.

The wages are satisfactory enough: £6 5s to £6 10s on the average, which is \$25 to \$27. That's so high in Great Britain that any overtime money he gets is taxed at 10s in a pound, or 50 per cent. As it is, he pays \$7.40 to \$8 a week in income tax. Then there are union dues, sick fund, contributions for the new government social insurance, a private pension fund that costs \$3.40 a week and the rent, which is \$4.50 a week. Prices are high. A satisfactory pair of shoes costs \$8 to \$10.



COST OF MATERIAL HANDLING

Per ton—based on
180 tons per day

In addition to these savings, Baker Trucks reduce warehouse rental charges by tiering, contribute to plant safety, speed production and material movement, and perform many other operations that reduce plant overhead.

EQUIPMENT

0.24



WITHOUT
TRUCK

TRUCK
COSTS
2.24

LABOR
COSTS
39.94

LABOR
COSTS
4.74

WITH BAKER
TRUCK

Handling conditions vary for each particular plant. Your own problem should be presented to an experienced material handling engineer. However, the following example outlines a simple method for determining the savings possible with an electric industrial truck. Let us assume a hypothetical plant with the simple problem of transporting daily 180 tons of material 200 feet from stockrooms to processing machines. Without power trucks this would require 10 truckers, each making 10 round trips per hour, or 80 trips per day, carrying 450 lbs. of material per load.

TABLE I—Handling Costs Without Electric Truck

| Based on 180 tons per day | Cost per day | Cost per ton |
|-------------------------------|----------------|----------------|
| Labor (85¢ per hour) | \$68.00 | \$0.378 |
| Social Security Taxes | 2.72 | 0.015 |
| Workmen's Compensation | 1.00 | 0.006 |
| Hand Truck Depreciation | 0.30 | 0.002 |
| Total | \$72.02 | \$0.401 |

In order to mechanize handling operations, the following equipment would be required:

TABLE II—Cost of Equipment for Mechanizing

| | |
|---|-------------------|
| Fork Lift Truck 2000-lb. capacity | \$4,100.00 |
| Battery | 600.00 |
| Charging Equipment | 840.00 |
| 200 pallets | 700.00 |
| Total | \$6,240.00 |

The truck, handling one-ton pallet loads of material, making 24 round trips per hour, could transport the 180 tons in 7½ hours.

TABLE III—Annual Expense—Truck Operation

| | |
|--------------------------------------|-------------------|
| Depreciation—Truck at 10% | \$410.00 |
| Battery at 20% | 120.00 |
| Charging equipment at 6½% | 56.00 |
| Pallets at 20% | 140.00 |
| Tires | 100.00 |
| Repair and Maintenance—Truck | 164.00 |
| Battery | 24.00 |
| Charging Equipment | 33.60 |
| Replacement of damaged pallets | 70.00 |
| Electricity | 82.00 |
| Insurance | 10.00 |
| Total annual expense | \$1,209.60 |
| Expense per day | 4.03 |

TABLE IV—Handling Costs—With Electric Truck

| Based on 180 tons per day | Cost per day | Cost per ton |
|-----------------------------------|----------------|----------------|
| Labor (Driver—\$1 per hour) | \$8.00 | \$0.044 |
| Social Security Taxes | 0.32 | 0.002 |
| Workmen's Compensation | 0.16 | 0.001 |
| Truck Expense | 4.03 | 0.022 |
| Total | \$12.51 | \$0.069 |

TABLE V—Savings With Electric Truck

| | |
|--|-----------|
| Savings Per Ton | \$ 0.332 |
| Savings Per Day (Handling 180 tons) | 59.51 |
| Savings Per Year (300 days) | 17,853.00 |
| Per Cent Reduction in handling costs | 83% |
| Annual earnings on investment | 286% |

While this example is obviously oversimplified, Baker Material Handling Engineers are prepared to show you how similar savings can be made on handling operations in your plant.

BAKER INDUSTRIAL TRUCK DIVISION of The Baker-Raulang Company
2175 WEST 25TH STREET • CLEVELAND, OHIO
In Canada: Railway and Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

Lifts, carries, tiers, loads of 1000 lbs. to 84"



CLARK TRUCLOADER

light, compact, fast,
designed for operating
in and out of trucks,
trailers, low-capacity
elevators and general
material handling
operations. Gas and
electric powered.

TO SEE CLARK TRUCLOADERS AT WORK
IN BUSINESSES LIKE YOURS SEND FOR
NEW PICTORIAL LITERATURE.

Visit National Material Handling Exposition
Cleveland... January 14-17

CLARK TRUCTRACTOR

Division of CLARK EQUIPMENT COMPANY
BATTLE CREEK, MICHIGAN

OTHER PLANTS - BUCHANAN, JACKSON, BERRIEN SPRINGS, MICHIGAN

Other CLARK Products

FORK LIFT TRUCKS
TOWING, DUMP AND
SHOVEL TRACTORS
RAILWAY TRUCKS

DRILLS
& GEARS

ELECTRIC STEEL CASTINGS
METAL SPOKE WHEELS
AXLES & HOUSINGS
TRANSMISSIONS

Prices on CLARK products will not be advanced in excess of increased costs.

George lives far out in the southwest corner of London, from where it takes him an hour to get to work. It is a private house with six rooms, a cellar, bathroom and, best of all, a little garden. He talks of the approaching days of retirement. Under the Social Insurance Act he and his wife will get 42 shillings (\$8.40) a week, just enough with their savings to scrape along in the little cottage with its flower garden.

India—Munna—of low birth, he does not remember his surname—does not know why he, his wife and four children have escaped the full horror of India's communal warfare. Nor is he particularly inquisitive on the subject. Although a faithful Moslem, he does not see why he should get involved in this bloodshed. He is far more worried about the eternal problem of how he can feed and clothe his family on the 130 rupees (about \$39) a month he earns as an engineer for the East India Railway Company.

"In the last six months I've got only 42 yards of cloth for my whole family," he said, pointing to his drab shirt and trousers. Food likewise is a pressing problem. From the railway ration shop he can obtain a small bottle of milk a day for his baby. For this he pays a little less than five cents, half the market price, but no one else in the family gets milk.

Munna and his family eat two meals a day. Each meal consists of baked bread (no butter) with either one vegetable curry or with dal (legumes). On special occasions Munna will buy a little meat, but that is far more expensive than the usual diet. Fruit? Munna laughed derisively.

The cost of living more than doubled in India during the war years. Munna's wages have risen only fractionally. None the less, he says he is better off than most of his fellow employees.

For one thing, the railway allots him two rooms for his family; lower-paid personnel get only one room. For his two rooms Munna pays about \$1.50 a month. For another, his salary is better than the average for Indian railway men, though not for engineers, most of whom are Anglo-Indians.

His railway career goes back nearly 30 years. He started at \$2 a month. Today he works many hours of overtime. He must wait around his hut for an emergency call at all hours. He smokes his hookah infrequently; tobacco is expensive and he can afford only 30 cents a month for this luxury. He has never seen a movie.

Italy—Some men are downcast in adversity, but not so Eugenio, locomotive engineer, first class, of the Ferrovie dello Stato, or Italian State Railroads. He began to work for the railroads thirty years ago.

At 48, he is the head of a family of five. Life is no bed of roses for him, but laughter comes easily to his lips, and his sky-blue red-rimmed eyes twinkle when he sits with his friends for scopone, a favorite Italian card game, in the railroad men's recreation center.

He works about 200 hours a month for 14,000 to 15,000 lire. At the present free-market rate this is something like \$20 a week. What will it buy? A month's wage is equivalent to the cost of four pairs of shoes or of the cheapest suit at the railroad men's cooperative. Luckily, things can be bought there on the installment plan.

southwest
takes him
a private
bathroom
ie talks of
nt. Under
d his wife
week, just
e along in
arden.

he does
not know
dren have
communal
inquisitive
hful Mos-
ld get in-
far more
of how he
n the 130
arns as an
Railway

ot only 42
," he said,
trousers.
em. From
obtain a
baby. For
cents, half
n the fam-

o meals a
bread (no
curry or
occasions
that is far
et. Fruit?

doubled in
na's wages
e the less,
ost of his

s him two
personnel
wo rooms
. For an-
average
n not for
o-Indians.
nearly 30
Today he
He must
gency call
kah infre-
d he can
for this
vie.

st in ad-
motive en-
ovie dello
He began
years ago.
ly of five.
him, but
, and his
when he
a favorite
oad men's

month for
sent free-
like \$20 a
th's wage
pairs of
e railroad
gs can be
lan.

ry 4, 1947

HOW TO QUIT BOTHERING about Tools

ANY drill, reamer or cutting tool "looks good" when conditions are ideal. The real test is—how does it look, *and* *behave*, when conditions are far from ideal? Celfor Tools look good in the tough, dreary routine of day-after-day work. They stand up—keep their cutting qualities—deliver the honest, reliable, workmanlike performance you expect of them.

It's a complete line: Celfor high speed Twist Drills, forged to shape and twisted hot—for tougher, denser metal; Celfor Reamers, a standard of good performance for more than 40 years; and Celfor Carbide Cutting Tools, of the unsurpassed excellence you associate with Celfor.



CELFOR TOOLS

Division of CLARK EQUIPMENT COMPANY
BUCHANAN, MICHIGAN
OTHER PLANTS—BATTLE CREEK, JACKSON, BERRIEN SPRINGS, MICHIGAN

Eugenio considers himself lucky, however, because he has two rooms and a kitchen in a large block of workers' apartments at 300 lire a month. Though he and his family are rather crowded—one of the daughters sleeps in the kitchen—he is better off than most of his neighbors, who have to take in lodgers.

He cannot afford to heat his home, but the place is spotlessly clean (his signora sees to that) and as shipshape as he can make it. The furniture consists of the bare essentials and is old and worn, but at least it is his own.

Eugenio believes that his chief worries are those of all Italian workers: how to make both ends meet. He also worries about his son. Eugenio finished his schooling when he was 13, and he is determined to give his son the best education he can afford. He wants him to go to an industrial school, which would fit him, at 19, to become a specialized workman and eventually a foreman. "I do not want him to become a railroad man," he says. "It is a fine profession, but the pay is not high enough for the physical wear-and-tear and the responsibilities it entails."

Japan—War and inflation have caught up with Takao Takatogawa and he worries about it as he drives his steam locomotive on the main line between Tokyo and Odawara. It's not that his hours—seven and a half a day—are back-breaking or that his pay has not been raised. It has. But his money won't buy anything any more. Food, fuel and clothes are hard to find. Forty-two years old and fifteen years a government railway employee, he makes 1,000 yen a month and gets a "family allowance" of 200 yen for his wife and child. The trouble is he doesn't get it all. Of an income of about \$25 a month in buying power, government currency regulations "block" \$10. Before the war he made 85 yen, but it was worth \$21, he got it all and Japanese prices were low.

He's satisfied with the one-story, three-room house he rents in Odawara for \$7 a month and likes to rest there in one of the dark-colored kimonos a middle-aged man ought to wear at home. Besides, he saves his uniform that way. The government is supposed to furnish a new uniform—it's black with horn buttons—every three years. "But I haven't had one since 1941," Takatogawa-san says.

His government ration, even with a recent 20 per cent increase, consists only of rice, sweet potatoes and seaweed, which the Japanese like. He must buy fish and vegetables on the black market. Because charcoal costs \$4 a sack (half a month's rent) his wife and daughter have to go out into the country and pick up sticks to burn. He doesn't like that. It's hard on them.

Mexico—Five times a day, beginning at 7 a.m., big Arnulfo coaxes a wheezy steam train between Mexico City and Lecheria. For 24 years he was a fireman on the express route to Piedras Negras, on the Texas border. His present run, one way, is only as long as Manhattan island, but at least it's all his.

The 43-year-old engineer earns a minimum of \$40 a week for a five-day week. They often give him an overtime run which brings his income to an average of \$70. His

NEAR YOU

there's a GRAYBAR man

who can save you time in obtaining railroad lamps and lighting equipment, pole-line supplies, communication equipment, electrical repair-shop supplies . . . everything electrical!

At strategic points throughout the nation, first-quality electrical items are conveniently available via Graybar. In the following list of Graybar warehouse locations, you'll find the name, address, and phone number of a Graybar man near you—a specialist who can help you obtain the electrical items you want with minimum delay. He'll gladly answer any questions about technical aspects, deliveries, prices, or Graybar service. *Graybar Electric Company . . . in over 90 principal cities. Executive offices: Graybar Building, New York 17, N. Y.*

ALABAMA

Fresno 2 — 101 Van Ness Ave.
Fresno 3-8347 • L. C. Johnson
*Birmingham 3 — 1529-31 First Ave., N.
Birmingham 4-1861 • J. A. Taylor
J. R. Feeney
R. L. Wear

ARIZONA

*Phoenix 2 — 434 West Madison Street
Phoenix 3-6131 • E. E. Leavy

ARKANSAS

Little Rock — 509 Exchange Bldg.
J. C. English

CALIFORNIA

*Los Angeles 12 — 201 Santa Fe Avenue
Trinity 3321 • R. R. Lockhart • W. K. Means
Oakland 4 — 222-24 Ninth Street
Glencourt 5451 • M. L. Wilkins
*Sacramento 1 — 1900 14th Street
Sacramento 2-1828 • A. R. Fryklund
*San Diego 1 — 720 State Street
Franklin 1361 • W. D. Evans, Jr.
*San Francisco 1 — Ninth & Howard Streets
Market 5131 • J. M. Perlewitz

COLORADO

*Denver 2 — 18th and Blake Sts.
Tabor 7116 • H. E. Woodring

CONNECTICUT

Hartford 6 — 344 Capital Ave.
Hartford 2-8266
*New Haven 7 — 25 Union Street
New Haven 8-4163 • P. F. Lee

DELAWARE

Wilmington 3 — 1005-1007 W. Fourth St.
Wilmington 4-6245 • L. E. McIntyre

DISTRICT OF COLUMBIA

*Washington 2 — 1355 New York Ave., N. E.
Trinidad 8080 • A. C. Eastborn

FLORIDA

*Jacksonville 1 — 12th & Main Sts.
Jacksonville 5-6785 • I. A. Williams
Miami 30 — 835 Northwest First Ave.
Miami 2-3168 • J. E. Powell
Orlando — 533-35 W. Central Ave.
Orlando 6133 • H. E. Smither
Tampa 1 — 416 Ellamae Street
Tampa 2601 • R. S. Robinson

GEORGIA

*Atlanta 1 — 167 Walton St., N.W.
Jackson 2261 • W. A. Northington
G. Sweeney
*Savannah — 570 Indian St.
Savannah 2-1121 • J. W. Horne

IDAHO

Boise — 2227 Fairview Ave.
Boise 6315 • L. Maynard Smith

ILLINOIS

Chicago 7 — 500 So. Clinton St.
Webster 2800 • E. J. O'Donnell
J. J. O'Connor
F. D. Wilson
Peoria 2 — 212 E. State St.
Peoria 4-8211 • W. W. Smilde

INDIANA

Evansville 14 — 1709-1713 E. Columbia St.
Evansville 3-5484 • N. S. Muse
Hammond — 5830 Calumet Ave.
Hammond 5830 • H. E. Werts
*Indianapolis 7 — 400 W. Ohio St.
Riley 7525 • L. E. Williamson

IOWA

Davenport — 206-210 East 5th St.
Davenport 3-2769 • E. L. Johnson
Des Moines 9 — 112 Eleventh Street
Des Moines 3-8614 • L. C. Esthus

KANSAS

Wichita 1 — 424 No. Rock Island Ave.
Wichita 3-4294 • E. F. Linnerson

KENTUCKY

*Louisville 8 — 624-628 So. Sixth St.
Jackson 1174 • C. H. Brown

LOUISIANA

*New Orleans 10 — 601 South Peters St.
Canal 1667 • A. J. McCall

MAINE

*Portland 3 — Center & Commercial Sts.
Portland 3-1761 • T. A. Huston

MARYLAND

*Baltimore 2 — 100 South Street
Saratoga 5050 • J. D. Rhoads

MASSACHUSETTS

*Boston 16 — 287 Columbus Avenue
Kenmore 4567 • G. J. Pink
Springfield 5 — 453 Worthington Street
Springfield 7-4373 • H. O. Edoff
Worcester 8 — 165 Commercial Street
Worcester 6-4311 • H. G. Rappel

MICHIGAN

*Detroit 1 — 55 West Canfield Ave.
Columbia 5500 • J. D. Diver • W. E. Watson
*Flint 1 — 118-122 E. Third St.
Flint 2-4101 • T. R. Macaulay
*Grand Rapids 2 — 432 Monroe Ave., N.W.
Grand Rapids 8-1231 • H. G. Cook
*Lansing 2 — 125 E. Shiawassee St.
Lansing 4-5434 • E. B. Roll, Jr.

MINNESOTA

*Duluth 2 — 320 West 1st Street
Melrose 6646 • P. D. Barber
*Minneapolis 15 — 824 South Fourth St.
Geneva 1621 • P. B. Hansen

*St. Paul 1 — 145 East 5th Street
Cedar 7491 • L. E. Luckman

MISSISSIPPI

*Jackson — 758 Ricks Street
Jackson 3-6316 • A. N. Saxon

MISSOURI

*Kansas City 8 — 1644 Baltimore Ave.
Grand 0324 • John Bevers • F. S. Davis
E. H. Williamson • R. B. Uhrig
*St. Louis 3 — 2642 Washington Ave.
Newstead 4700 • Charles Newbill
R. M. Peck

NEBRASKA

*Omaha 2 — 1120 Capitol Ave.
Atlantic 5740 • D. L. Harper

NEW HAMPSHIRE

Manchester — 103 Hampshire Lane
Manchester 1345 • P. A. Darn

NEW JERSEY

Newark 5 — 2 Liberty Street
Market 2-5100 • H. A. Cobaugh

NEW YORK

*Albany 4 — 40 Van Woert St.
Albany 5-1564 • C. E. Kirkpatrick
Buffalo 3 — 77-79 Swan Street
Washington 3700 • K. L. Thielscher
*New York 14 — 180 Varick Street
Walker 5-8000 • W. J. McNulty
Rochester 4 — 186 North Water Street
Stone 5400 • J. A. Royce
Syracuse 1 — 327 North West Street
Syracuse 2-1281 • N. E. Olsen

NORTH CAROLINA

Asheville — 221 Patton Avenue
Asheville 6002 • H. H. Hix
*Charlotte 1 — 120 W. Morehead St.
Charlotte 7177 • Y. P. King
Durham — 303 South Duke Street
Durham F-113 • L. A. Womeldorf
Winston-Salem 1 — 321-327 Brookstown Ave.
Winston-Salem 5173 • W. A. Moorefield

OHIO

Akron 9 — 255 James Street
Franklin 2121 • H. M. Nazor
*Cincinnati 2 — 310 Elm Street
Main 0600 • Ned Muse • J. V. Neal
J. J. O'Keefe
*Cleveland 14 — 1010 Rockwell Ave.
Cherry 1360 • A. R. Hicks
Columbus 15 — Third & Chestnut Sts.
Main 5408 • C. E. Furber
Dayton 2 — 332 West Monument Ave.
Hemlock 1268 • R. P. Dunning
Toledo 2 — 1700 Canton Street
Main 8131 • A. R. Weaver
Youngstown 1 — 211 N. Champion St.
Youngstown 4-4578 • W. C. Robinson

OKLAHOMA

Oklahoma City 2 — 706 West Main St.
Oklahoma City 3-9351 • W. A. Arthur
Tulsa 3 — 303 Public Bldg.
Tulsa 2-2181 • F. L. Cummings

OREGON

Portland 9 — Park & Flanders Sts.
Broadway 1445 • J. F. Ryan • Marvin Peck

PENNSYLVANIA

Allentown — 1941 Hamilton Street
Allentown 3-3181 { W. L. Hall
Bethlehem 1-0657 {
Harrisburg — 400 So. Second Street
Harrisburg 7303 • H. H. Binder
*Philadelphia 7 — 910 Cherry Street
Walnut 5405 • W. W. Frazee, Sr.
*Pittsburgh 22 — 37 Water Street
Court 4000 • J. G. McNeely
Reading — 22 South Third Street
Reading 6231 • T. J. Hopkins

RHODE ISLAND

Providence 3 — 194-196 Richmond St.
Dexter 8100 • E. Lum

SOUTH CAROLINA

Columbia — 1927 Main Street
Columbia 2-2125 • J. H. Littleton, Jr.

TENNESSEE

Chattanooga 1 — 1222 Carter Street
Chattanooga 6-5624 • L. Morgan Smith
Knoxville 30 — Henley St. & Union Ave.
Knoxville 3-6171 • F. L. Andridge
*Memphis 3 — 484 S. Front Street
Memphis 8-1207 • R. B. Sayre
*Nashville 2 — 313-315 8th Ave. So.
Nashville 6-7161 • S. L. Cook

TEXAS

*Amarillo — 701 East Third Ave.
Amarillo 2-6778 • L. P. Bell
Beaumont — Cypress & Hickory Sts.
Beaumont 6921 • J. E. Fontaine
Corpus Christi — 1310 Agnes Street
Corpus Christi 8012 • R. E. Broyles
*Dallas 2 — 400 South Austin St.
Central 6454 • A. Frank Hamm
*Fort Worth 2 — 1605 Commerce St.
Fort Worth 2-3178 • E. F. Haling
*Houston 1 — 2001 Commerce Street
Charter 43561 • T. B. Paige
San Antonio 8 — 1401 N. Hackberry St.
Fannin 6274 • J. Emmet House

UTAH

*Salt Lake City 13 — 245 So. First West St.
Salt Lake City 3-3894 • D. H. Hutchinson

VIRGINIA

*Norfolk 1 — 333 West 21st St.
Norfolk 2-2727 • L. E. Burford
W. R. Nottingham
*Richmond 19 — 6th and Cary Sts.
Richmond 2-2833 • F. W. Dickerson
M. C. Shorey
L. E. Walker
*Roanoke 5 — Salem Ave. & Sixth St.
Roanoke 8105 • W. E. James

WASHINGTON, D. C.

A. C. Eastburn

WASHINGTON

*Seattle 4 — King & Occidental Sts.
Main 4635 • R. J. Franzen
*Spokane 8 — 152 South Post St.
Riverside 3151 • W. A. Sparks
*Tacoma 1 — 2112 A Street
Main 0166 • C. A. Moon

WISCONSIN

Milwaukee 2 — 778 N. Milwaukee St.
Marquette 1946 • R. J. Harkins

house is a four-room, single-story "railroad" place, for which he paid \$5,000 in 1943, after 22 years in the cab. It has two canaries, a parrot, a black dog, a tree, a glowing vigil light, a huge pretty-girl calendar on the dining-room wall, a large radio and a set of champagne glasses.

Russia—Serge is a wide-shouldered, merry-eyed man who in the thirtieth year of the Bolshevik revolution finds his personal prospects improving daily. A railroad "driver," the son of a driver and the father of a potential one, he is enthusiastic about his job and about hunting and fishing. He thinks life in Moscow is "improving every day" and the railroads, to which he has devoted 22 years of work, are "growing better and better."

Serge's run is on the Moscow-Riga line, called the Kalinin line. His locomotive pulls fast passenger trains, and he makes about ten runs a month. His personal production plan calls for 3,600 kilometers, or 2,250 miles, a month. Most months he exceeds his plan and does about 6,000 kilometers, or 3,725 miles. His regular pay and bonuses, earned by exceeding his plan, bring him average monthly wages of 4,000 to 4,500 rubles, a good salary in the Soviet Union. This is equivalent to about \$666 to \$750 a month. [There is an arbitrarily set rate for conversion of rubles and dollars. But, as in the case of some other currencies not widely exchanged, it is difficult to translate rubles into dollars in the terms of purchasing power in the United States.]

Spain—Like every Spaniard who isn't rich, Pepe devotes much of his thoughts to the question of feeding and clothing his family. He is one of the more fortunate because he has a good job. His home is cheap and he stands well with his union, but he feels the pinch of serious shortages and the rampant black market. The son of a locomotive engineer, he was able to go to school until he was 16. He became an apprentice, then a fireman and engineer and recently a foreman in the locomotive shops.

Although an active member of the Falange-dominated transport union, he thinks more about the practical problems of life than about the larger aspects of politics. He thinks the Franco regime has helped the working man. Anyone who thinks otherwise, however, is unlikely to be an engineer but is much more likely to be a former prisoner in "conditional liberty."

The Franco regime, Pepe says, has helped railroad workers by standardizing the system. About thirty companies, some good, some bad, all independent, have been merged into a single national system. Now a man can work up to be an engineer in eight to ten years after two to three years in the shops and then six to eight years as a fireman.

As an engineer he starts at 8,000 pesetas [about \$560] a year. It doesn't buy much. Railway workers, like most workers in big organizations, benefit by commissaries run at low prices. Only those who buy through commissaries can have much hope of getting coal.

A locomotive engineer can work up to a maximum salary of 10,000 pesetas a year, but at that rate an inferior suit of clothes costs him about three weeks' pay.

Bonuses are given now for efficient work. With those and overtime pay—above his normal forty-six-hour week—a good en-

*At these warehouses, there are Graybar men who have special experience in handling railroad electrical requirements.

60,000 ELECTRICAL ITEMS ARE DISTRIBUTED

THROUGHOUT THE NATION

...VIA
Graybar





HOW TO REDUCE O. S. & D. REPORTS

Most shortage and damage claims can be directly traced to handling at terminals. Reduce the number of handling operations and you reduce the possibilities of shortages and damages . . . and reduced O. S. & D. reports always mean more efficient terminal operation.

Towmotor Fork Lift Trucks, designed for 24-hour, full-power service . . . lifting, transporting and stacking commodities of almost every size, shape and weight, will reduce handling operations, cut handling time and labor.

There's a Towmotor Fork Lift Truck or Accessory to keep freight terminal operations on schedule. Send for a Pocket Catalog.

Send for Special Bulletins Describing the Towmotor
UNLOADER • UPENDER • SCOOP • CRANE ARM • RAM
EXTENSION FORKS • EXTENSION BACKREST
OVERHEAD GUARD

TOWMOTOR CORPORATION
DIVISION 21, 1226 EAST 152ND STREET, CLEVELAND 10, OHIO



TOWMOTOR
THE ONE-MAN-GANG

**FORK LIFT TRUCKS
and TRACTORS**

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

gineer can nearly double his pay, Pepe says, particularly as conditions today cause frequent delays and consequent overtime.

Sweden—If 50-year-old Anders were not a locomotive engineer, he says he would strive to become one. Railroading is in his blood. His father was a locomotive driver before him, at the throttle of a coalburner, while Anders drives a shiny engine on the state electrified railroads. His two brothers are locomotive engineers.

If Anders worries, it is not about another war—he says he does not believe another war is possible—or over finances; his \$37.50 a week is sufficient for his family and even enables him to keep his 16-year-old son in college. Anders' interest in life is confined to his home, his wife and children (he has a daughter 19) and to his trade union, of which he is an official. His work keeps him from home an average of 70 hours a week; two-thirds of this is on actual service and one-third at rest billets. He works twelve days straight, then has two days off.

His city residence is a neatly furnished, modern two-room flat with many conveniences, including central heating and a shower bath. Like most Swedes, he has a telephone. He bought his flat in a co-operative house four years ago with a down payment of \$1,670. His charges are \$18 a month for amortization and service.

United States—It will be another ten years, George figures, before he gets a regular run and regular hours, maybe another decade beyond that before he's ready for retirement at about \$125 a month, but he views this prospect as pleasant. Time goes swiftly in railroading, he says. He started as engine wiper when he was 18. That was twenty-six years ago, and his pay was \$1.25 for an eight-and-a-half hour day.

This year George has averaged about \$600 a month; he has touched as high as \$650. It's a strain, usually 16 hours a day, but a man would be a fool or a loafer not to get it while it's there.

George's father was an engineer, all his mother's family were in railroading, and his younger brother is firing. "In the blood," George tells you. The most his father ever made was about \$18 a week.

George and his wife have a centrally heated, spotless, well-furnished six-room apartment on the ground floor of a two-family white frame house set in a neat garden. There's a dining room, a tile bath and a gleaming, modern kitchen with all the electrical gadgets—ice box, mixer, iron, washing machine, vacuum cleaner. The family has two radios, one large, one portable, and plenty of books, mostly fiction.

"Got a 1937 Packard, smooth as a Rolls," George says contentedly. "Bought her second-hand in 1942 for \$250—a steal. She's good for another ten years. Take the wife and kids out in it when I can grab the time."

The house, great backyard for the kids, big porch for summer days and evenings and the garage—"get it all for \$55 a month," he explains, and he calls it reasonable. He saves only \$25 a month, but there's a roast every day since the meat shortage ended. His wife shops wisely and scrimps through on a food allowance of \$30 a week. That doesn't include milk. George

pay, Pepe
today cause
t overtime.
nders were
e says he
ilroading is
locomotive
ottle of a
es a shiny
railroads.
engineers.
about an-
not believe
r finances;
his family
is 16-year-
rest in life
and child-
and to his
ficial. His
average of
this is on
rest billets.
then has

furnished,
y conveni-
g and a
es, he has
t in a co-
th a down
are \$18 a
ervice.

another ten
ne gets a
maybe an-
ne's ready
month, but
nt. Time
says. He
e was 18.
and his
half hour

ed about
s high as
rs a day,
oafer not

er, all his
ling, and
"In the
most his
a week.
centrally
six-room
f a two-
n a neat
tile bath
with all
ker, iron,
er. The
one port-
fiction.
a Rolls,"
ght her
a steal.
Take
n I can

the kids,
evenings
\$55 a
reason-
nth, but
the meat
sely and
e of \$30
George

The
Ge

It's c
you
fired
umb
smoo
don't
sions
The
easi
We'
order
near
us be
we h
where
prom

S
P
L
C

Title:
ales

Railwa



The Going's Getting Smoother...

It's our distinct pleasure to tell you that, after many long and tiresome years of waiting, the lumber situation is beginning to smooth out a bit. However, we don't want to build up false illusions or appear overly optimistic. The lumber shortage, although easing gradually, still exists. We're still unable to fill every order to completion. But, take heart! Each passing month finds us better able to aid you... and we hope the day won't be far off when we can again serve you promptly.

CAR DECKING
•
CAR SIDING
•
CAR ROOFING
•
CAR FRAMING
•
CAR LINING
•
CROSSING PLANK
•
TIMBERS
•
GENERAL
MAINTENANCE
LUMBER

Southern Pine Lumber Company

Head Office: Diboll and Pineland, Texas
Sales Office: Texarkana, U. S. A.

drinks two quarts a day, so they take six quarts every day at 23 cents a quart, and that's more than \$30 a month. His wife gets by on her pre-war fur coat—"muskrat, I think; can't remember exactly"—and George finds three suits and five pairs of shoes plenty.

Someone told George that Russian railroad engineers were expected to cover about 3,725 miles a month and got as high as \$750 for doing it. He's inclined to think that's "baloney."

"In the U. S., under the law, you can't work more than fifteen hours fifty-nine minutes out of twenty-four hours," he points out, "because they figure beyond that you're overtaxing a man's endurance, and they're right. To cover 3,725 miles you'd spend a hell of a lot more time than sixteen hours a day in the cab. Can't see it."

Yugoslavia—In the new Yugoslavia Ivan, a locomotive engineer since 1932, finds life easier than before the war.

Thirty-eight-year-old Ivan lives in a government-owned apartment building in the railroad workers' section of Belgrade. It occupies three rooms with a balcony and pantry.

In a backward country like Yugoslavia Ivan stands out. Not everyone can run an engine. He has been a railway worker since 1926, first as a roundhouse mechanic and now as an engineer on passenger trains. Life is difficult, but Ivan has his philosophy: "I like to eat and drink only the best. My children are entitled to the same, so we don't save any money."

His basic pay is \$76 a month. He gets \$40 for extra runs. The family spends about \$2 a day for food, which includes beef and horse meat, vegetables in season and fruit. The diet is not too well balanced. Fresh fruits and vegetables are hard to find in winter.

The family's rent is 360 dinars, about \$7.20, a month. That includes garbage disposal and chimney sweeping.

Ivan is a member in good standing in his union and is a committee member on the local council. His work is concerned with sanitation and clothes distribution. He likes visiting.

He used to drop in to the local bar, but "since my wife has equal rights I don't dare," he said.

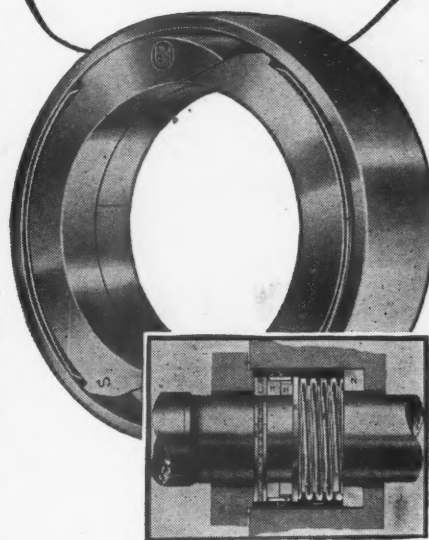
P. & D. Service Hearing Slated for Chicago February 18

Initial Interstate Commerce Commission hearings in the Nos. 29555 and MC-C-542 proceedings, pertaining to pick-up and delivery services by railroads and motor carriers, respectively, have been set for February 18, at the Hotel Sherman, Chicago, before Commissioner Rogers and Examiners Stiles and Aplin.

According to a commission notice, C. O. Fischer, chairman of the Connecticut Public Utilities Commission; H. P. Apperson of the Virginia State Corporation Commission, and K. D. Williams of the Missouri Public Service Commission, has been designated by the National Association of Railroad and Utilities Commissioners to sit in the hearings under the so-called co-operative plan.

Quality Proved

*in hundreds of
locomotives....
over millions of
miles traveled...*



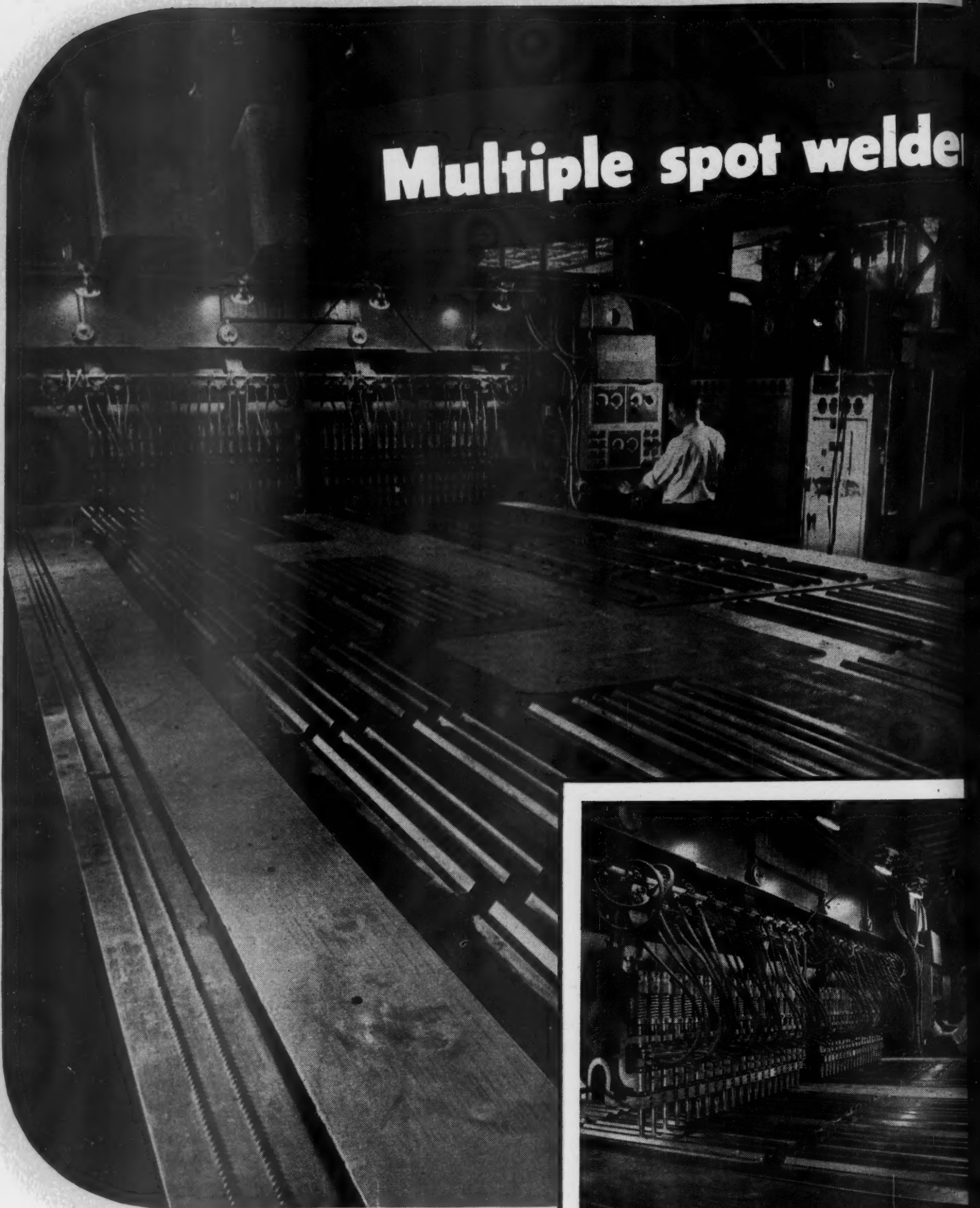
Performance proves! In nearly fifty years of service to the steam power field, P-M Metallic Rod Packing has earned its position of leadership. Its star performance in packing steam pressures is reflected in the selection of materials and application of expert, painstaking craftsmanship in manufacture. Each segment bears the Paxton-Mitchell "P-M" trade-mark and is made of selected metals which withstand the extreme pressures of today's operating conditions. Special composition metal segments available for super-heated steam.

P-M Metallic Rod Packing

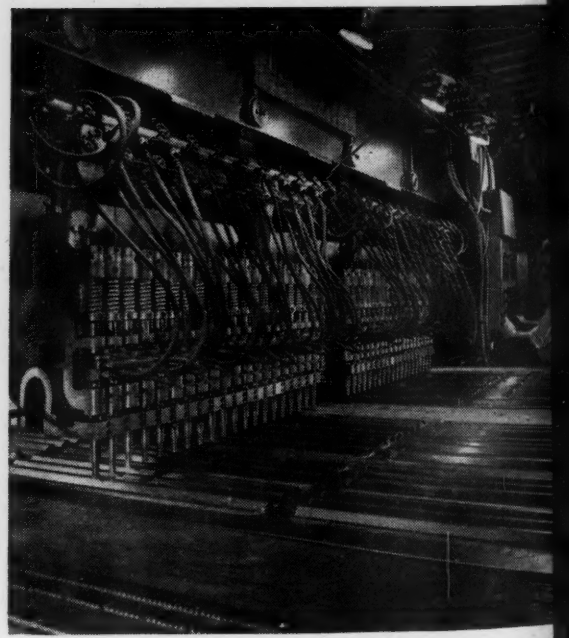
The Packing That Packs

Paxton-Mitchell Company
Engineers — Founders — Craftsmen
Omaha 5, Nebraska

Multiple spot welder



Patent Applied for



Pullman-

CHICAGO • NEW YORK

de

n.

W YORK